

THE MACDONALD JOURNAL

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The Macdonald Journal is published quarterly (February, May, August, November) by the Macdonald Community Liaison Program of the Faculty of Agriculture of the Macdonald Campus of McGill University.

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Second class registration number 0463.

Subscription rates are \$6.00 for one year. Outside Canada — \$10.00 for one year.

Printed by Harpell's Cooperative, Gardenvale, Quebec.

This Issue

This issue marks a fresh beginning for Macdonald's magazine. Dean Lloyd explains in his open letter on
Larry Johnston reports on a busy, full year of happenings
Reunion '82, past reunions, busy grads — Tom Thompson of the Grad Society brings it all to us, starting on
It wouldn't dare rain on Macdonald's outdoor Convocation
For an overview of the recent past in sports, read Bill Ellyett's "Macdonald Athletics: Past"
For some "Random Reminiscences of a Retiring Professor," read Ralph H. Estey on
From '64 to '82, what grad doesn't know Mrs. "V"?

Macdonald grad and Deputy Minister, Research, Agriculture Canada, Dr. E.J. LeRoux discusses "Food, the Universal Crisis and the Challenge for Agricultural Graduates" on The CIFST held their Silver Anniversary Meeting in Montreal. Professor E. Idziak was Conference Chairman
Professor E. McKyes and Brent M. Hamre report on the CFIEI Conference on
For recent important research on "Disease Control Through Foliar Nutrition," read V. Goss and W.D. Marshall on

Graduates and Staff in the Department of Animal Science bring us six special articles on **Poultry**:

The Excess Fat Problem in Broiler Chickens
Housing Turkey Males in Cages
How often should semen be collected?
To Maximize Fertility in Turkeys: how often should the female be inseminated and with how many spermatozoa?
Energy Levels and Calcium Sources in Turkey Hen Diets
Guinea Fowl: A new taste in poultry?

Mac Professor Stuart B. Hill stages a successful coup in the Seychelles on
With genuine concern for polite conversation, "They Dined with the Queen" on
Curator Professor J.D. MacArthur and Chairman of the Volunteers Helen Jones explore the Morgan Arboretum on
Some 34 people offer Extension Courses at Macdonald. Meet four of them on
There's a bug in my luggage — actually there are 100 000 of them! "Four Entomologists in Central America" starts on

Features

Seeking Solutions
Diploma Corner
Prof Profile
Newsmakers

Cover Story

The caption for our cover could read "Just Graduated." It could also read "Just Married" for Holly Phillips and Graham Drake were married on May 8 and graduated with B.Sc.'s in Agricultural Engineering less than a month later on June 4. Holly, from Pointe Claire, and Graham, from Montreal, met here at Mac and are now working in the Department of Agricultural Engineering until they find permanent employment, which they hope will be soon. Graham Drake's father graduated from Engineering at McGill; Holly is carrying on a family tradition. Her parents C.O. Douglas and Marjorie Phillips also met while studying here at Mac. "My Dad and I had one or two of the same professors," Holly said. Her father was working on his Masters and her mother was in Education. They married here and lived on campus. Holly told us, "I spent the first year of my life in Diaper Dell" (now the site of the Centennial Centre where Holly and Graham held their wedding reception). We wish Holly, Graham, and all the graduates of 1982 every success.

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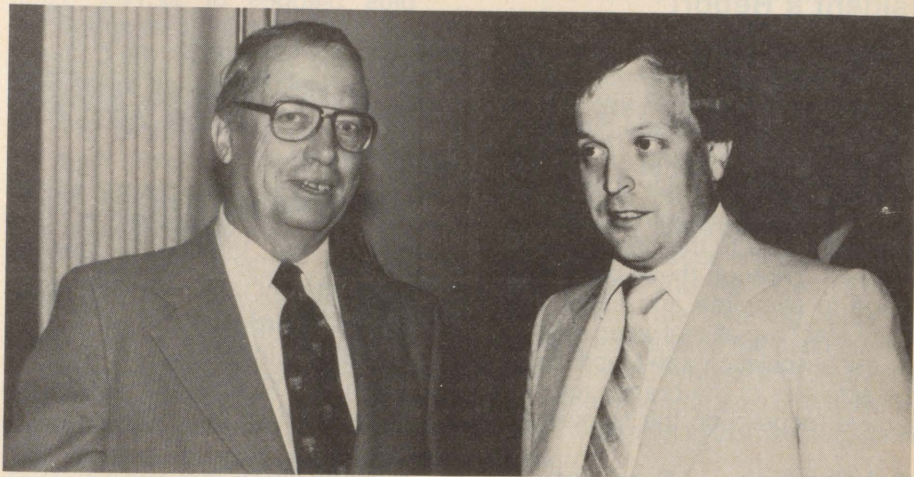
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Mr Mac Grad,

always a pleasure to bring things to our alumni. Did you know with this year's class of 227, there are now some 4500 living Mac grads scattered around the world? There is no doubt that our influence is growing at an ever increasing rate, and that there are no geographical boundaries. You will have noted that this year's message is being carried in a completely different format. This in itself gives some explanation.

During the past year, the Faculty of Agriculture and the School of Food Science carried out an examination of future interaction with the community we serve. One conclusion reached was that our target community should include the following: the rural population, the general public, the business establishments related to agriculture and food (agribusiness), and our alumni. In order to describe activities that will be directed towards these four target groups, we have adopted the name "Macdonald Community Liaison Program." Within this program, four activity areas have been identified — rural extension services, general community relations, recruitment, and publications. In the area of publications, we have made some significant changes in the Macdonald Journal, our publication which has since 1940 been mainly serving the rural population. In the immediate past the Journal had been published 10 times per year with a total of 40 pages per issue. With this August issue, we have commenced our new series of issues of the Journal with a total of 40 pages per issue — in short, we shall have summer, fall, winter, and spring issues from now on.

Each issue will focus on one of the four target groups, while at the same time providing items of interest to the other three. Actually, we hope the entire issue will appeal to all readers. For example, in this issue about 40 per cent of the material should be of special interest to our alumni, with the remaining 60 per cent being divided equally among the other three groups. About 25 per cent of the fall issue will be devoted to agribusiness; the winter



Dean L.E. Lloyd, left, and Larry Johnston, President of the Macdonald Branch, photographed at the June '82 Convocation. The President's Report is on the following page.

issue will concentrate its attention on the rural population, with the spring issue primarily focused on the general public.

From this, I hope that each one of you will realize that we at Mac feel that we must do more than we have in the past to keep in touch with our alumni. To this end, this first issue of the new Macdonald Journal is being sent out to the 4500 grads, regardless of their location. In return, we ask only that you give serious consideration to subscribing to the Journal — details of annual subscription rates will be found elsewhere in this issue.

There is something else you can do to make subsequent issues of the Macdonald Journal of greater interest to the alumni group. You can write to us with news of your current activities, tell us what **you'd** like to see in the Journal, and what you believe we should be doing to widen our communication pathways. In particular, we believe that those of you working in some aspect of agribusiness could do much towards establishing an interrelationship among alumni, agribusiness, this Faculty and its graduating students that would be beneficial to all. It seems quite possible that alumni, writing about their activities in the Macdonald Journal, might well facilitate communication between the graduating students and the world of potential employers. Let us hear from you, please, and remember that a subscription would do much towards indicating that we're on the right track.

Before concluding, it is a pleasure to remind everyone that the Macdonald Agriculture Campaign is now history, and the new building and other facilities have been paid for. To all those alumni who so generously contributed to the campaign, we can only express our deepest gratitude. You will be pleased to realize that all future contributions designated for faculty development and made through the Alma Mater Fund office will find their way into an account that is available to the Dean. At the present time, it is planned to use such funds to continue providing entrance scholarships, to enable the library to improve its holdings in certain specialized areas, to move forward with our objective of returning the appearance of the campus to its earlier elegance, and to further our Community Liaison Program. Your continuing help will be of immense value during times which, we realize, are trying for all.

How about trying to get out to the Fall Reunion at the beginning of October? If you're too far afield for this kind of a trip, how about dropping us a few lines? We'd truly appreciate seeing you or hearing from you.

Yours sincerely,

L. E. Lloyd

L.E. Lloyd
Dean, Faculty of Agriculture
and Vice-Principal,
Macdonald Campus

President's Report

I am pleased to report that the response of the alumni to the efforts of the branch executive and directors has been very gratifying. It is the branch objective to provide a program of activities of interest both to the current students and to the graduates of Macdonald. Through these programs we hope to stimulate and foster the "spirit of Mac" we all feel when reflecting on our association with Macdonald.

The activities of the branch for this year have focused on the following:

1. **Scholarships — Bursaries — Loan Fund:**

The \$1,000 entrance scholarships offered by the branch have been maintained and new initiatives have been taken to supplement Bursary and Loan Funds. Awards and prizes were presented at the Annual Banquet.

2. **Campus Care and Development:**

Several classes were encouraged to provide class gifts for specific campus care projects (i.e., grove of trees).

3. **Recruitment/Promotion:**

The branch continued to sponsor important "extra" activities designed to facilitate distribution of information on study programs at Macdonald.

4. **Student Life:**

a) **Student Placement:** The branch has supported the distribution of a graduating class brochure. In addition, the branch has agreed to assist in establishing a career day program in conjunction with the Annual Macdonald Reunion.

b) **Gold Key:** A branch committee has formalized arrangements to re-introduce on campus the Award for Student Leadership.

5. **Macdonald Phonaton:** The first Alma Mater Fund Phonaton in 10 years was held on April 13th and a follow-up evening was scheduled in late May. It provided effective communication to our alumni

plus pledges of \$2,700. Total returns to date indicate support of more the \$42,000 for the College. An excellent follow-up to the successful Macdonald Agriculture Campaign.

6. **Macdonald Reunion '82:**

Plans are well underway to develop and expand Reunion, and the Chairman, Steve Olive, met with class events chairpersons in early May. Together, they have confirmed plans for the events of October 2. Details will be sent out.

7. **Outside Meetings:**

The branch is anxious to contact Macdonald graduates in areas of greater concentration (i.e., Toronto, Ottawa Maritimes, etc.) To date an event will be coordinated with the "outside branch" program for later in August.

8. **The St. Lawrence Valley Natural History Society:**

The branch became a group member of this Society. It is determined to develop a living natural museum designed to broaden the visitor's perception of the St. Lawrence Valley. Its objectives are to foster an appreciation and understand-

ing of the physical and biotic character of the Valley and to stimulate interest in research in the development of renewable resources for the betterment of society.

9. **Macdonald Journal:**

A branch committee is reviewing the possibility of further involvement with the College magazine to make it more effective and appropriate for our members if time, circumstance and funds warrant this.

The executive and directors of the branch have an additional objective to see the appointment of a Chairman, Vice-Chairman, and Committee for the Macdonald Alma Mater Fund for 1982-83.

We welcome your ideas, comments and participation in all our activities, and I appreciate very much those who have shown interest and participated in our programs because this is the inspiration and satisfaction for those who work on the various committees.

I look forward to seeing everyone at Reunion.

**Larry Johnson, B.Sc.Agr.'72
President,
Macdonald Branch.**



FISHING FOR FUNDS: Helping to extend the network in reaching graduates through the phonaton were (top) left to right, Larry Johnston, B.Sc. (Agr.) '72 and Larry Lengyel, B.Sc. (Agr.) '80 with (bottom) left to right, Pat O'Donoughue, B.Sc. (Agr.) '77 and Harold Blenkhorn, B.Sc. (Agr.) '50 as they compare notes during "coffee break."

"Macdonald Clan" Celebrates Reunion '82

come back to celebrate on Homecoming Day, Saturday, October 2, 1982. In the 10 and more anniversary classes that will be on campus for the weekend and select events of interest to you which will give an additional opportunity to meet graduates and friends of Macdonald.

The Chairman of Reunion '82, Steve Olive, B.Sc. Agr. '68, has planned two special events to involve all returning graduates and friends. The highlight of the Reunion is an occasion to reflect on Macdonald of years past and see some examples of the outstanding research and teaching facilities and projects underway on the campus.

"We have confirmed a full schedule of events and activities," notes Reunion Chairman Steve Olive, "Our graduates' luncheon at 12 noon on Saturday, October 2, will feature an all-class gathering with special recognition of the 50th anniversary class. The Vice-Principal and Dean of the Faculty of Agriculture, Dr. Lew Lloyd, will address the Graduates' Luncheon, as will

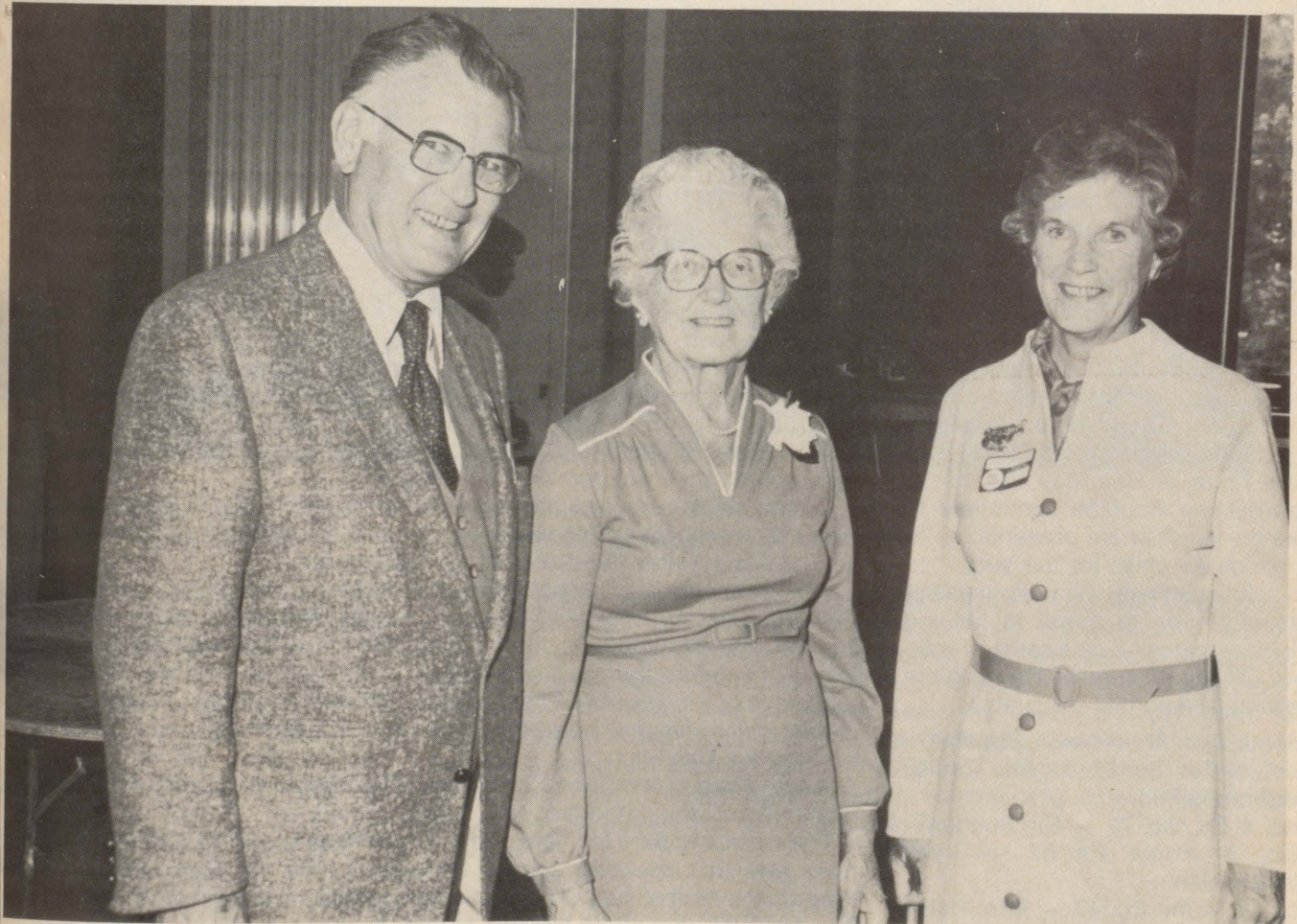
the Macdonald Branch executive in its annual reporting to the membership. To provide some indication of the accomplishment of Macdonald in the provincial, national, and international research areas in agriculture and agricultural development, Dr. Gus MacKenzie, Associate Dean, Research, will be our guest speaker. His brief luncheon comments will point out such deserving accomplishments as the sugarcane feed research program in the West Indies, the nitrogen fixation experiment, and additional comments on the most popular projects like the Dairy Herd Analysis Service.

Tours of the Macdonald-Stewart Building, continuous hospitality, registration and display in the Centennial Centre, ballade tours of the general campus, farm, and other areas, plus a special Macdonald Branch reception in the afternoon, will all be the lead up to the main "Graduates' Reunion Dinner-Dance." This grand spectacle with reserved

tables and special activities to honour the 25th anniversary class of 1957, is a welcome development in our traditionally popular Reunion program.

The Reunion Committee knows that "often the most relaxing, inexpensive, and best-attended moments are the quiet ones inbetween the hectic activities. We plan to give our Macdonald Clan and their guests many opportunities to renew acquaintances and recall fond memories of their days at Macdonald. Even our graduates' Reunion dinner-dance will provide for coffee in the Centennial Centre Lounge throughout the evening, plus other quiet areas outside the main event." At least Steve Olive has included the major recommendations of his Reunion class chairmen in the planning for Reunion '82.

Plan now to be a part of the celebration. Come on. Join the Macdonald Clan during Reunion '82. A special brochure and notice of the details will be mailed to you shortly.



MEMBERS PAST: On this occasion former Dean, George Dion, Laura Rowles, and Wendy Dion catch up on what's new at Mac and in the Ottawa where the Dions now reside. (Photo by H. Cadmus)

Class Chairmen — Key to Reunion Enjoyment

"It is the interested class chairmen who provide the initiative, the exchange of information among graduates, and the general encouragement to get everybody together for the Fall Homecoming," explained Steve Olive, Reunion '82 Chairman, as he spoke to a reception for all of the class chairmen assisting in the planning for the Macdonald Homecoming this fall.

One of the special requests was to include in the program an up-date of information on the food science program, possibilities for the future in research and development, as well as an overview of the general future research projects and current activities in progress on the campus. In response to this, Steve Olive has arranged for Dr. S. Weber, Director of the School of Food Science, to hold a seminar on the Saturday morning of Reunion before the Macdonald Luncheon, and Dr. Gus MacKenzie, Associate Dean, Research, has agreed to give a brief and spirited report to the luncheon on research for today and for the future at Macdonald.

To assist the class chairmen in their constant effort to be in touch with classmates and colleagues and provide last minute details for their reunions, Susan Reid Boyle, the coordinator of this activity for the Graduates' Society, continues to provide all the practical services possible through newsletters, mailings, and questionnaires.

A much sought after honour is the attendance shield for the annual reunion program. Therefore, every returning graduate is encouraged to register before 7 p.m. on Saturday, October 2, to permit the Reunion committee to make the appropriate presentation to the honoured class for the year.

In acknowledging the willingness of class chairmen to assist in helping their classmates enjoy a campus visit, Steve Olive paid special tribute to the following Macdonald graduates:

Diploma Agr.'77 — Kevin Boushel
Agric. & Fd. Sc.'77 — Ms. Louise McDonald-Pilon
Agric. & Fd. Sc.'72 — Bill Suddard
Agric. & Home Ec.'62 — Lyall MacLachlan
Agric. & Home Ec.'47 — Mrs. Helen Goldhamer

(Continued on page 5)



DIALING FOR DOLLARS: Left to right: Jane Thomson, B.Sc. (F.Sc.) '73, M.B.A. '79 notes the telethon technique of Jean McHarg, B.Sc. (H.Ec.) '60 as Judy Kandalauft, B.Sc. (F.Sc.) '73 looks on.

Macdonald Branch Talks Turkey

It has been several years since Macdonald graduates planned a phonathon to keep the members posted on current needs and developments on the campus.

This is the first year that special efforts were made to contact recent graduates and request their support of the College.

On two occasions graduates volunteered to participate in the phonathon and reach as many of our Montreal area alumni as possible to alert them to the annual Alma Mater Fund project for Macdonald.

The emphasis is on Scholarship, Faculty Promotion, Library Development, Campus Care, Athletics, and Student Services. An additional incentive was provided by the \$250,000 Challenge Gift Offer made by an anonymous donor in March. Therefore the April 13th and May 25th phonathons were timely opportunities to remind our members to consider new or continued support of Macdonald which was matched 2 for 1 and 1 for 1 respectively in total value of donations to the University.

A new Alma Mater Fund Committee is being recruited to give guidance and leadership to this important Macdonald project.

The results to date indicate donations of more than \$42,000 for the 1981-82 fund year (not counting special donations) plus the matched gift amounts towards the area of support determined by the anonymous challenge gift donor. The 1982-83 phonathon will see alumni even more effective when they "talk turkey" for Macdonald.

Graduating Class Officers Appointed

"The permanent link between former students and Macdonald is the graduating class," explained Kevin Boushel, President of the Macdonald Students' Society and a Director of the Macdonald Branch of the Graduates' Society of McGill University.

He was speaking to the students selected to maintain the tradition of class newsletters and class reunions and in general encourage contact among alumni and between alumni and the College for the class of 1982.

Class Officers to date include Andrea De Rome, Claude Gascon, and Jon Waterhouse. And to be sure those first newsletters get off to a good start, the graduates were asked for permanent addresses as they prepared to celebrate at the Spring Convocation.



REUNION FLASHBACK

The highlight of Reunion '80 was the presentation of the special Mastery for Service Award to Dr. William Rowles, M.Sc. '26, Ph.D. '28, dedicated researcher, author, and teacher for more than a quarter of a century at Macdonald. This unique Macdonald Award, which was offered for the first time as part of the 75th Anniversary activities, is to be offered every five years (the next one in 1985), and the selection committee of staff, students, faculty, and alumni welcome nominations at any time c/o the Dean of the Faculty of Agriculture. The recipient is to have provided, through personal effort, outstanding contributions to the advancement of the Macdonald community.

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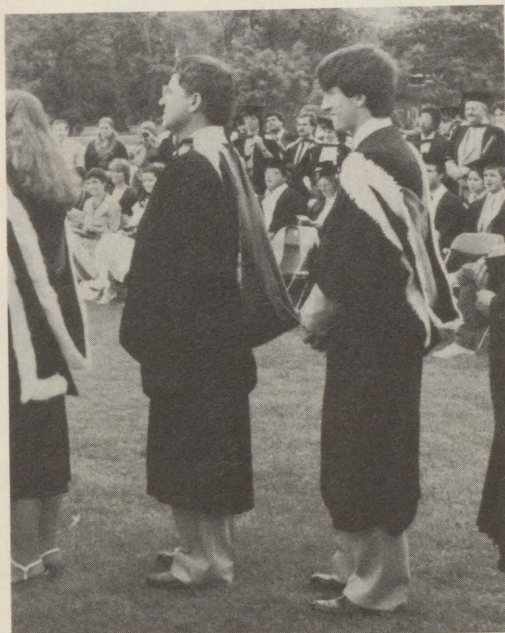
ric & Home Ec.'42 — Douglas
Henderson
ric. & Home Ec.'37 — Scott
Kneeland
riculture '22 — James M. Winter
riculture '32 — Mrs. W.G. Petrie
riculture '32 — Dr. A.W.S. Hunter
r. & Home Ec.'57 — Kenneth
Woolrich
r. & Home Ec.'57 — Mrs. Gloria
Bishop
r. & Home Ec.'57 — Mrs. John
Jared

CONVOCATION

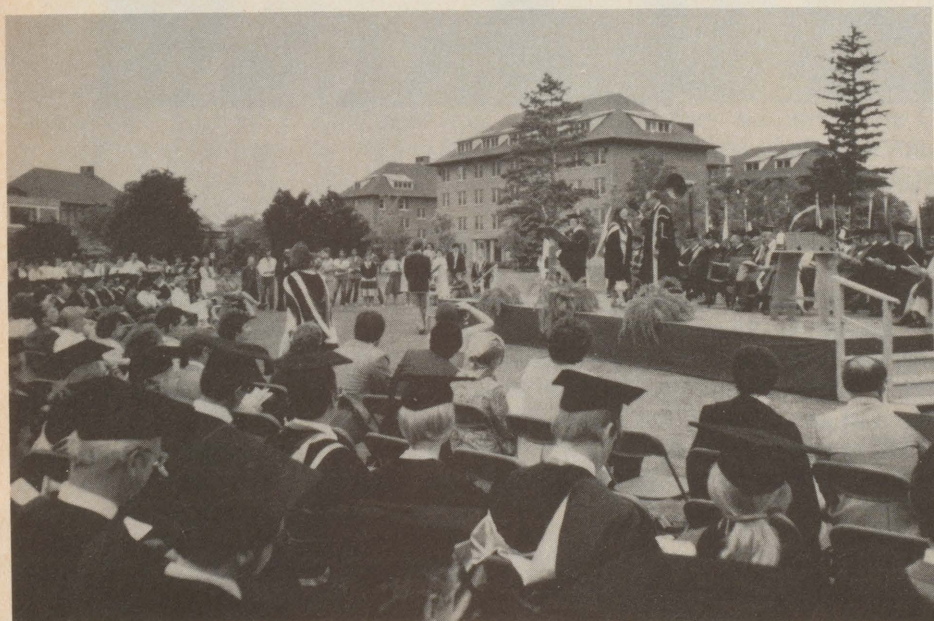
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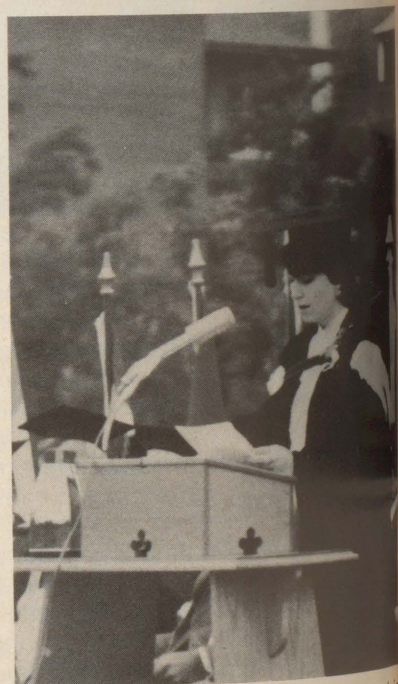
Rain threatened but thankfully held off as 227 graduates received their diplomas and degrees in a colourful outdoor ceremony, the only Convocation still to be held out-of-doors at McGill. Above right, Professor J.E. MacFarlane presents Martha Farkas to Chancellor Conrad F. Harrington. Martha won the McGill Alumnae Society Prize. Right. Eddy Mellina, second from left, won



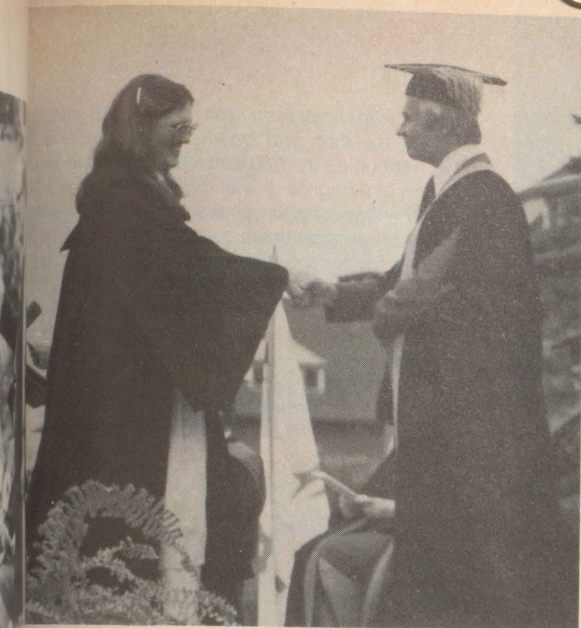
the Governor General's Medal. Other prize winners were: Food Science: Doreen Sharon Cohen, the Governor General's Medal, Deborah J. Corbett, the Harrison Prize; Agriculture: Gaétan Bourgeois, the Cutler Shield, Yves Quintin, the R. Haddon Common Prize in Agricultural Chemistry, and Richard Robert Sparling, the Gray Prize in Microbiology.



The Macdonald Campus, a beautiful setting for Convocation.



Andrea De Rome, from Montreal, majored in General Agricultural Sciences and was chosen by her classmates as Valedictorian.



ploma student Mary Clara Murphy, of St. Bruno, receives warm handshake from Principal Johnston.



Chairman of the Board of Governors Chief Judge Alan B. Gold and Emeritus Professor Ralph H. Estey.

H. A. STEPLER INTRODUCTION of PROFESSOR R. H. ESTEY for EMERITUS PROFESSOR

Ralph Howard Estey first appeared at a McGill University convocation in 1951 to receive his degree of B.Sc.Agr. He was again a graduand in 1956 when he received his doctorate degree. He joined the Department of Plant Pathology in 1957 as a lecturer and was recognized for his excellence in 1972 when he was named Professor of Plant Pathology.

In 1960 Dr. Estey initiated the first graduate program in nematology in a Canadian university. He later strengthened his expertise in nematology with a sabbatic year of study at Imperial College, London.

Dr. Estey has served the university in many ways. He was chairman of the Department of Plant Pathology from 1970 to 1976, when it became a part of the Department of Plant Science. In addition to his heavy teaching role he has supervised the Biology greenhouses, served as elected chairman of Staff/Faculty meetings, was a member of the University/MAUT student discipline committee, and was the elected representative of the Faculty on Senate.

At the national and international levels Dr. Estey has served as President of the Quebec Society for the Protection of Plants, President of the Canadian Phytopathology Society, and member of many of its committees. He was associate editor of the Canadian Journal of Plant Science for some 6 years. Dr. Estey was Canadian representative on the Council of the International Society for Plant Pathology and he has been guest speaker at several international meetings of nematology and/or plant pathology.

Dr. Estey has been recognized by his peers by his election as a Fellow of the Linnean Society of London and the award of life membership in the European Society of Nematologists.

Dr. Estey has also served his community. He was Vice-president of the Quebec Home and School Association, President of the Macdonald Home and School Association, and co-founder of the Catharine Traill Naturalists' Club.

But let me assure you that Dr. Estey, while being a dedicated plant pathologist, has other interests which he pursues avidly. In 1979 he, a biologist, had the unique distinction of winning a Social Sciences and Humanities Research Council award which enabled him to travel and do library research for his book on the history of plant pathology in Canada. Further evidence of this avocation was his invitation as guest speaker to the Early Colonial Section of the United States Bicentennial Symposium of the Department of Agriculture.

Dr. Estey is a numismatist — a coin collector to the uninitiated. He was President of the Lakeshore Coin Club.

Mr. Chairman of the Board, it gives me great pleasure to present to you and this convocation, our colleague, Ralph Howard Estey, and ask you to designate him Emeritus Professor of our Faculty and of the University.

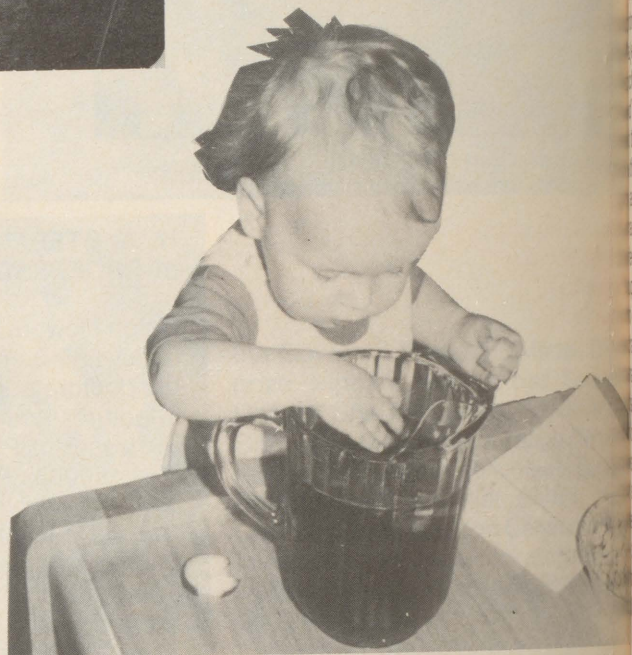
Howard A. Stepler, Department of Plant Science



tos by H. Clarke, M. Costain, and R. Costain.



Left: Ken Anderson, left, waited 40 years to wear his cap and gown. He began a B.Sc. in Agriculture in 1940 and left in 1942 one course short of a degree. It was decided, in time for this year's Convocation, that Ken's career in veterinary pharmaceuticals could be used as an equivalent for the course he was missing. On the eve of his retirement he collected his degree. Congratulations! Below left: There were almost as many photographers as there were subjects. Below: A graduate of the year 2004? This youngster attended the reception following the Convention ceremonies and, like most grads of '82, enjoyed the punch, or at least picking out the tasty fruit.



CONVOCATION ADDRESS

In his Convocation Address, Dr. Campbell dealt mainly with Kenya, the accomplishments, the concerns, and the challenges, and that major portion of his speech follows. In his opening remarks, Dr. Campbell said that it was a special honour for him to have been given an honorary degree by McGill University. He described convocations as happy times for graduands, their families, and the faculty.

Dr. Campbell said that he was convinced that graduands in agriculture today face greater challenges than their colleagues in almost any other field because of the growing significance of agriculture. He said that it is important in Canada and other developed countries, but that it is even more challenging in the Third World.

"The challenge is especially great in Africa. A World Bank report in 1981 in-

HONORARY DEGREE

It is my privilege to introduce to you, Mr. Chancellor, and to this Convocation, Dr. Donald Ralph Campbell, a distinguished university administrator and a leading Canadian economist in international agricultural development.

A native of eastern Ontario, Ralph Campbell's illustrious career began with a five-year stint as a full-time farmer on his home farm. He then served as a pilot with the RCAF from 1942 to 1945, during which service he was awarded the Distinguished Flying Cross and Bar.

Following World War II, Ralph Campbell was included among the large number of veterans attending Canadian universities. Majoring in political economy, he received the B.A. degree from the University of Toronto in 1949. Named a Rhodes Scholar, he studied philosophy, politics and economics at Balliol College, Oxford, during the period 1949-1951, and was awarded B.A. and M.A. degrees from that University.

Dr. Campbell's university career began at the Ontario Agricultural College in 1951, and after one year as a Lecturer he was named Professor and Head, Department of Agricultural Economics, a position he held for 10 years. From 1964 to 1976, Dr. Campbell was located at the University of Toronto. He was a Professor in the Department of Political Economy throughout this period, but in addition he served as Associate Dean of the Faculty of Arts and Science from 1964 to 1968, and as Principal of Scarborough College from 1972 to 1976. In 1976 the University of Manitoba displayed great wisdom in appointing Dr. Campbell as President and Vice-Chancellor and benefited from his guidance until 1981. His administrative skills, his stimulation of people to work together, and his accessibility to all levels of staff have highlighted Dr. Campbell's contributions to three different Canadian universities.

At present, Dr. Campbell is economic adviser with the Rockefeller Found-

ates that the per capita income of countries south of the Sahara excluding South Africa and Nigeria was \$329 in 1979. Life expectancy is lowest in the world and only 25 per cent of the population have access to safe water. I could give other data, there are enough to indicate the challenge.

The Third World, or the developing countries of Africa, Latin America, and Asia (excluding Japan, Israel, and the rich countries) have the bulk of the world's people but they are unable to feed them adequately, let alone provide the health care, education, housing and cultural development that human dignity demands. We should not feel smug in our current condition of superiority. When the ancestors of most of us were living in western and central Europe and were wearing animal skins years ago many of today's developing countries had or had civilizations comparable in many ways to what we have now. We should start from a feeling of inherent inferiority. Yet, for whatever reasons of population growth, available resources, Toynbee's "response to challenges," bureaucratic breakdown,

failure to produce appropriate political organizations, or inability to respond to the challenges of the technological revolution — they have fallen far behind in material development. For many of them, the philosopher Hobbes's description of life applies — nasty, brutish, and short.

"I should like to speak briefly of some of the problems and opportunities of one of these Third World countries, the one I know best, namely Kenya. When one speaks of the Kenyan economy, one speaks primarily of agriculture for 80-85 per cent of the people are farmers. Right there is a statistic which you graduates in agriculture can recognize as a problem because economic development is accompanied by an ever-declining farm population as a percentage of the total. Here in Canada the proportion has fallen from about 30 per cent 50 years ago to less than 5 per cent now. That 5 per cent is so productive, however, thanks to technological advances and the calibre of Canadian farmers, that they can produce enough farm products to feed the other 95 per cent and still provide large amounts of exports. In Kenya, as in many less developed

countries, even with 80 per cent of the people engaged in farming, it is always a close thing whether the country will be able to feed itself or not. This is not quite fair in the case of Kenya, for exports of coffee, tea, sisal, and pyrethrum are the principal earners of foreign exchange. Without oil or minerals of any kind, Kenya is dependent on her farmers and a small but growing industrial sector based on a large pool of low income labourers.

"The progress made in the past 80 years is nothing short of phenomenal. Mrs. Campbell and I have become devotees of Kenyan history and are constantly reminding ourselves of what has been accomplished. In the course of 80 years Kenyans have transformed themselves from a simple unsophisticated society into one which has many of the attributes and potentials of a modern economy. Small holder farming, dependent upon maximum production per acre on farms of 2-5 acres and human labour has been able to adopt modern technology to an extent that is positively amazing. Small holders produce coffee and tea of a quality superior not only to the large Kenyan estates but to the best in the world. They do so on hilly land which Canadian farmers would regard as hopeless for crops. They have revolutionized our conceptions of what is possible from a difficult terrain.

"The most important problem of Kenya, as of other African countries, is the growth of population. Some, such as Nigeria and Zambia, have large areas of farmland still unexploited, but most of the other African countries, including Kenya, do not. The population of Kenya was estimated to be 2.5 million in 1900, 5.8 million in 1948, 15.3 million in 1979, and will be 32 million in the year 2000. With 80 per cent of the land basically uncultivable and semi-desert, the prospects are grim if population continues to grow at the present rate.

"These data are not remote from those of our own in Canada. My grandfather was one of 13 children and I expect that your great-great-grandfather had a similar multiple. In our Canadian case, the decline in birth rate was phenomenal, from 13 or so to 4 or 5 to 1 or 2. The real questions in the case of countries like Kenya are: (1) will the birth rate decline rapidly with changes

on to the Government of Kenya. The role of adviser is one which he has played many times in the last 30 years as his skills in planning and coordinating have been sought for agricultural economic development. During a long span of time, he served 18 months as a Ford Foundation consultant to the Jordan Development Board and two years as adviser to the Ministry of Finance and Planning in the Government of Kenya. As well, he has served on development projects in both Barbados and Ghana and was a member of the Liaison Committee of International Development Organization (jointly sponsored by CIDA, IDRC and AUCC). At home in Canada, he served as a member of the Canadian Government Task Force on Agriculture in 1968-69, and authored the report "Canadian Agriculture in The Seventies."

Dr. Campbell has also served his profession well, serving as President of the Canadian Agricultural Economics Society and as President of the Agricultural Institute of Canada. In return, his profession has shown its respect for his contribution by making him a Fellow of the Agricultural Institute of Canada.

He has been the recipient of other honours including an LL.D. from the University of Guelph in 1974 and an LL.D. from the University of Winnipeg in 1977. He was made an Honorary Fellow of St. John's College of the University of Manitoba in 1980 and a Doctor of Canon Law by St. Andrew's College of the University of Manitoba in 1981.

Dr. Campbell, may I present to you, so that you may confer upon him the Degree of Doctor of Science, *honoris causa*, this distinguished economist, respected administrator, and ardent advocate of international cooperation Dr. Donald Ralph Campbell.

Lloyd, Dean
Faculty of Agriculture

in socio-economic conditions (as in Canada), and (2) can the vast numbers be fed in the meantime? In Kenya, as in most African countries, both the birth rate and death rate have been extremely high for generations. Over the past 40 years the death rate has declined dramatically with better health care and nutrition. In 1948 out of every 1000 live births 184 infants died within 1 year; by 1979 the number of infant deaths had declined to 87 out of 1000 — still high but a remarkable improvement.

"If Kenya and other African countries are to increase their standards of living substantially, the one *sine qua non* is a rapid decline in the birth rate. It seems clear that the first essential is a change in attitudes toward desirable family size. Fortunately for Kenya her President, Daniel arap Moi has taken a strong stand in this respect pointing out in major speeches that what should be the objective in families is not quantity but quality.

"What has been remarkable in Kenya has been the way in which small farmers, and I mean farmers with 2-5 acres in the high potential areas, have been able to increase production. Many people feared that with the departure of many British farmers after Independence 19 years ago (although a fair number are still there as Kenyans) output would fall dramatically. In fact the opposite has occurred, and studies show that output per hectare on small farms is substantially higher than on large farms. You will recognize I am sure that when land is the scarce factor, as it is in Kenya, it is output per hectare which must be maximized.

"I do not mean to idealize the situation. Kenya is a low income country with many serious problems. If it were not so people like myself would not be there. One of the most serious problems other than that of population growth, (which far exceeds any other problem) is that of Government intervention in the market place. Kenya is more oriented to free enterprise than most African countries but still finds it difficult to give up the dependence on regulations, price controls, and other Government interventions which she inherited from colonial days.

"When I was a university graduand — almost too long ago to remember — I believed strongly that governments

were wiser than the people they governed. Well, governments may be wiser, but they are generally less capable of making centralized decisions of the right kind than the sum of the decisions of small individual entrepreneurs and consumers.

"Governments have a vital role in establishing the "rules of the game" — health regulations; standards of weights, measures, and grades; minimum incomes for the disadvantaged; educational opportunities for those who have the ability; infrastructure in the form of roads and airports; even "stop loss" price supports for farmers. In a complex impersonal society government intervention is essential, but it should be limited to those areas in which the sum of individual decisions produces the wrong answer.

"Let me say a few words about the people of Kenya. They are delightful: friendly, helpful, interested in education, generally hard working — in fact not very different from Canadians. Forty years ago, they were largely illiterate. In that respect they were 80 or so years behind many of our forefathers. I have the deed to the farm which my great-grandfather bought in 1854 in eastern Ontario in which he signed his name with an X. Since In-



Chancellor Harrington conferring a Doctor of Science degree *honoris causa* on Dr. Donald Ralph Campbell, with assistance from registrar Stephen Olive.

dependence in Kenya in 1963 there has been a remarkable transformation in education. Whereas only 16 per cent of those over 54 years can read and write, 86 per cent of Kenyan children of age 10-14 are now in school. This fact holds out great hope for the future in spite of the growing population.

"I should not leave the impression that all is well in Kenya. For many, life is indeed "nasty, brutish, and short" as Hobbes described it a few hundred years ago in Britain. The landless people who barely manage to keep body and soul together are a continuing challenge. The slums of Nairobi are a shocking contrast with the wealthy areas of the city for the latter are the most beautiful that I have ever seen. Unemployment is high and average labour income is low. Foreign exchange is scarce and Kenya's devaluations have been even greater, though not much, than ours in Canada.

"Of all the problems, though, I come back to two related ones — population growth and limited resources, especially of high potential land since Kenya's people are agrarian. With assistance from people like yourselves, either through temporary aid or in the form of advisors, I have confidence in the future."

MACDONALD ATHLETICS: PAST

W.R. Ellyett
Director, Athletics Department

Part I of III

The history of the Athletics Department is a memorable one to all students who attended Macdonald College. Those hockey games on the outdoor rink and then in the new artificial Glenfinnan skating Rink, Varsity football games on the Main Field, and Basketball games in the Stewart Gym all bring back memories.

Macdonald had a proud tradition in athletics and especially on the intercollegiate scene. Remembered are these special events like Homecoming, Fall Royal, and Winter Carnival, which brought schools the likes of Sir George Williams, R.M.C., Bishop's, St. Mary's, Loyola, and even McGill to our campus.

The author can remember Allan Arge sinking basket after basket in Stewart Gym as the students cheered from the balcony and sidelines. One can remember Doug Carpenter and Brian Murray leading the Aggies on the field and how about Jim Dickie, a football standout. What about those coaches at the helm: Coach Pugh, Coach Nichol, Walker, Watson; do they hold fond memories?

Macdonald was a school to be reckoned with when it came to intercollegiate sports. Always high, trying its hardest, never lose. School spirit and support were always with the teams.

Macdonald also had great interclass rivalries. The annual Tabloid meet, the relay race, basketball, and tennis to name a few.

In 1970 the Faculty of Education transferred its operation to the downtown campus and Macdonald, now with on-campus Agriculture and Food Science, was left with only 400 undergraduate students. Intercollegiate sports were, for the most part, excluded from the program of athletic activities. Coach Pugh, who at the time was Director of Athletics, left his position to become Assistant Dean of Students at Sir George Williams. From there he moved to Ottawa to become Executive Director of the C.I.A.U. (Canadian Intercollegiate Athletic Union). Brian Murray (now coach of the Washington Capitals of the National Hockey League) took over as Director. Unable to field large intercollegiate teams, the program was mainly intramurals and regionals.

In 1971 the John Abbott College CEGEP moved on campus to use many of the facilities vacated by Education. It was decided to join the athletic departments of Macdonald and John Abbott and compete intercollegiate as MAC-JAC. After a year's competition in the Quebec University League, MAC-JAC decided to join the CEGEP league and become a powerhouse. But in 1973 Brian Murray left as Director of Athletics and Macdonald had less and less players on the intercollegiate teams.

During the 1973-1974 year Macdonald Athletics became a non-active force in Macdonald activities. The students tried as best they could to organize activities but were without leadership or professional help. As a result Macdonald Athletics ceased to exist.

It was decided, in 1974, by the Macdonald administration to hire a new Director to try and rekindle the Macdonald spirit and give the students an athletic program. JAC, who had moved in and taken over most of the Athletic facilities, had now reached a population of 3000 students. Macdonald had some 500 undergraduates. The MAC-JAC liaison was now really impossible as the CEGEP students were always dominating the varsity teams. As the new director, I decided to cut ties with JAC and begin a new Athletic ap-

proach. Mac renewed its ties with the Quebec University League and entered competition on a small team level. It no longer offered football, hockey, or basketball. It fielded teams in rugby, woodsmen, golf, cross-country, badminton, and curling. The main emphasis was put on the intramural program to try and bring back some spirit and give the students an outlet from their studies. Some of the students who were deeply involved were Wally Boyle, Jim Donahue, Peter Arntfield, Bob Thompson, and Neil Duffy.

The Macdonald Athletic program became more involved with the total student population as student numbers grew to over 800 undergraduates in 1980. The Macdonald program promotes recreational and instructional to reach as many students as possible. The once proud and strong intercollegiate program now only offers a sprinkling of activities to its students. The intramural program is as strong as it ever was and offers over 26 different types of activities, including an interclass hockey league with a 25 game schedule and playoffs.

The Macdonald program has changed dramatically over the last 12 years. The reasons are many: personnel, budgets, facilities, student numbers. But today there is still that special feeling about being a Macdonald Aggie.



The 1972 basketball team, back row, left to right: Cam Little, Manager, Dave Algar, Wayne Boyle, Peter Kelly, Chris Hunter, Jean Michaud, Barry Russell, Howie Hoag, Manager. Front row: Pat Baker, Coach, Pat Norwood, Pete Harvard, Jim Guild, Andy Christie, Joe Amiel, Ken Smythe, Al Armitage, Coach.

Some Random Reminiscences of a Retiring Professor

by Ralph H. Estey
Emeritus Professor, Department of Plant Science

When asked to write a brief commentary on my 25 years at Macdonald, I readily agreed, because, after all, 25 years hasn't been a long time to review. However, before I actually began to do any writing on the topic, one of my younger colleagues (they are all younger now), remarked, "So, you've been here a quarter of a century. You must have seen many changes in that time." Suddenly, it did seem like a long time — a quarter of a century seems longer than 25 years — and, yes I have seen many changes, not all of which I feel have been for the good of Macdonald.

When I first came here the "Security Force" consisted of one man, affectionately known to everyone as "Old Bob" and he had only one arm. The buildings were wide open day and night, and only the private offices were ever locked. Bob didn't have an arduous task because stealing from the College was unthinkable and vandalism was a foreign word — one that applied to the lunatic fringe of less civilized societies. Of course there were the annual high jinks of the graduating classes, but these were primarily humorous, fun things, involving little, if any, damage to the fabric of the College. Occasionally the "fabric" of the curtains or the carpets of the girls' dormitory received some minor damage, as, for example, when a horse that must have had some urinary tract disorder was discovered by the matron in the third floor hallway the morning after a class party. Incidentally that class assessed itself and collected more than enough money to compensate for the minor damage and enough perfume to neutralize the horsey odour that arose from the carpet for several weeks.

I recall the letter from the Dean to Dr. Coulson, Chairman of the Department of Plant Pathology, suggesting that because outsiders had been seen in the buildings the previous Sunday and two microscopes were missing from one of the laboratories, it would be

wise to lock the outside doors of the Biology Building. Professors Callen and Morrison, representing the two departments in the Biology Building, were asked to look into the matter of door locking, keys, etc. Locking the entrance doors to the Biology Building was so uncommon that no one seemed to know where the keys were kept. Eventually the main side entrance and the two end doors were locked at night and on Sunday, but for the convenience of the staff and students — and anyone else who really wanted to get in — the door to the greenhouse was left unlocked, as was the door from the greenhouse to the Biology Building. This minor inconvenience, which we all rather grudgingly accepted, was the beginning of what has become an expensive but essential security system.

I recall that most of the affairs of the College were very well administered by Dean Brittain and the Registrar, Brad Walsh. Faculty meetings were held largely to give a stamp of approval to recommendations or actions already taken by the Dean and the Registrar. The junior staff, of which I was a member for several years, could attend Faculty meetings but were not allowed to vote. We elected a representative to vote for us at these meetings. This annoyed me, because on several occasions I had to wait until after the meeting to ask the junior representative to oppose an action that had already been voted upon. Helen (Devereaux) Maconochie recently reminded me that it was I who asked her, the representative of the junior staff on faculty, to inquire of Dean Dion if the regulation could not be altered a bit or somehow circumvented enough to allow every member of the teaching staff the right to vote on all matters that arose at Faculty Meetings. The idea was sympathetically received by the Dean and since that time all members of the teaching staff have had voting rights. Gaining the right to vote didn't really change anything, except psychologically, because we of

the junior staff were generally wise enough to wait for the sage comments of Professors Common, Rowles, Crampton, David MacFarlane, and perhaps one or two others before taking a stand or voting on a major issue, and major issues were rare in those days.

Graduating from the junior to the senior staff was such a gradual evolutionary process that I have no recollection of when the change in my status occurred. Probably it is because the line of distinction, which was once very definite and divisive, became so blurred and the staff so united that such a "graduation" is no longer evident to anyone.

As a member of the teaching staff including a stint of teaching while a graduate student, I have served under four Deans: Brittain, Dion, Blackwood, and Lloyd and have occupied seven different offices for varying periods of time exceeding one year, in three different buildings. I have liked and enjoyed a friendly relationship with all four Deans, but there was something special about Dr. Brittain that evoked my admiration. I'll never forget the time he called on me and my family when we were living in one of the huts of "Diaper Dell," just for a visit — but undoubtedly also to give me some friendly advice. This he did in such a gentle way, spiked with a bit of his inimitable humour, that I could easily have missed the point of his visit. That was just the first of many similar and always welcome visits by that remarkable man, who, long before becoming Dean, had been the first plant pathologist to be hired by the Province of British Columbia. Thus we had a number of common interests even though he was primarily an entomologist and I a plant pathologist.

When Jack Cram resigned to accept a position with the Family Herald and Weekly Star, Dean Brittain asked me if I would be his replacement as Editor of the Macdonald Farm Journal and teacher of an extension course the



is offered at that time. I have often wondered if I could have become an editor and learned to write with the ease and flair of editors that I have known. Probably not, because I have never been at ease with words. However, I chose to teach and I think that was the right choice for me. Perhaps I think that because I have been exceptionally fortunate in having class after class of very good, very responsive, and very likable students. When I stop to think about it that could be said about the vast majority of the students who came to Macdonald. Even during the sixties when there was student unrest that resulted in disruptions in many universities, the attitude of our students was generally constructive.

As one grows older there is a natural tendency to think that many of the events or activities of the past were better than their equivalents today. I might call it the "good old days" complex. I know our society has improved in many ways, but I also believe that we at Macdonald, both staff and students, are culturally poorer than we once were. It used to be traditional for the staff to put on at least one play during the winter, the students had debating competitions, and there was "Amateur Night" or a one-act play almost every Wednesday evening. Those were the days when the Literary and Debating Society — the "Lit and Deb" — was flourishing; when the students vied with one another for prizes in the annual Green and Gold review, and when they took pride in publishing the Failt-Ye Times in proper literary style.

I have some very pleasant memories of the staff parties we used to have at Enaladale. They were fun affairs because we gladly entertained ourselves with readings, recitations, music and games. I'll never forget the stories read by Bill Rowles, the poetry and humour of Hadden Common, or the music that Laura Young could produce so effortlessly from the old piano. It would be dishonest of me to imply that my life here has been filled with pain and happiness. Fortunately happiness has been the dominant feature, but there have been brief periods of sadness and some of regret. It was very sad to see Dr. Coulson getting old and having to retire. He was the man who had, unknowingly, persuaded me

to come to Macdonald College as a student and later to return as a member of his staff in the Department of Plant Pathology. I suppose he was a sort of father figure to me in the realm of plant pathology. When Dr. Coulson left here to live with his sister in Markham, Ontario, he gave me his sectional oak bookcase and a number of his personal books. I felt honoured and very grateful for this evidence of his kindness to me. Consequently, it seemed doubly sad for me to attend his funeral only a few years later.

A sadness of another kind was the demise of the Department of Plant Pathology which Dr. Coulson had done so much to strengthen. It was the only such Department in a Canadian University and one of the distinctive features that made ours uniquely different from other Faculties. In a Province with two Faculties of Agriculture it seemed to me that we should retain as many unique features as possible, especially one that was as successful and internationally well known as our Department of Plant Pathology.

Over the past 25 years the image of agriculture as a way of life or as a profession has gone through at least two distinctive cycles. Shortly after the Second World War there was a back-to-the-land movement spearheaded by the war veterans. This was soon followed by agricultural surpluses, low farm incomes, and a general trend away from the land. This trend was reflected in the number and the quality of students coming to Macdonald College. As the numbers of incoming students dwindled there was a half-hearted move on the part of some staff members to drop the word agriculture from our degree designation and from the main thrust of our teaching program. The suggestion was also made that perhaps we should adopt a more sophisticated name and become a Centre or Institute for the Biological Sciences. This idea fell by the wayside, partly because its sponsors couldn't agree on an acceptable name, but mostly because the majority were very proud of the Macdonald tradition and

wouldn't support it. That trend away from farming and the desire for greater sophistication was also reflected in the name of this Journal, which had long been the Macdonald Farm Journal. It dropped the "Farm" but added the sub-headings: Agriculture, Home Economics and Education in January 1968. Home Economics became Food Science in May of that year and all three sub-headings were dropped from the masthead with the first issue of 1970 when Mark Waldron in an Editor's Note was saying, "We think we've stepped into the '70s boldly..."

Well, it soon became apparent that we had stepped boldly into the '70s and the image of agriculture began to change again. In fact, the producers of food and fibre became almost an industrial elite in the face of what was reported to be impending famine due to overpopulation and the rapid loss of good farm land to urban sprawl and paved areas throughout the world.

The doom mongers hadn't realized that virtually all animal populations — including humans — instinctively reduce their rate of reproduction in the face of actual or feared overpopulation. In the human population this is seen in the increasing number of homosexuals and of couples who choose not to have children. Also, they hadn't counted on the phenomenal ability of agriculturists and others to continue increasing the rate of food production.

Yes! We stepped into the '70s boldly, attitudes changed, and student numbers increased. But what of the '80s? They should be more exciting than the '70s. To me, one of the most exciting features of this decade has been the unexpected but highly desirable influx of Francophone students. They have added a new dimension to the life of our Clan, one that bodes well for the future.

When I think of the opportunities for Macdonald in the '80s I have a twinge of regret, because I won't be actively participating in their development. C'est la vie.

Mrs. "V"

If there is one person on the Mac Campus with whom most students have come in contact on a fairly regular basis, it has been Jean Vauthier, Mrs. "V", Manager of the Centennial Centre and Secretary-Treasurer of the Students' Society. When we learned that Jean Vauthier would be leaving Macdonald later this summer, we asked Kevin Boushel, President of the Students' Society for the 1981-82 year, to chat with Mrs. "V" about her years on Campus. Kevin came to Mac in the fall of 1975 as a Diploma student. After graduation, he worked in the Diploma Program for two years and has since returned to studying for his B.Sc. He enjoyed his year as President, particularly meeting people both on and off campus, and recommends that students should get involved in campus activities. He admits that being President can be hard on marks and also that student participation is down on most campuses. He said that according to statistics involvement and spirit is still higher than average at Mac.

Kevin Boushel: What brought you to Mac?

Mrs. "V": I was doing a little part time work for Dr. Grant here at Macdonald and a very dear friend, Terry St. Martin, heard that the students were looking for a permanent Secretary-Treasurer. As I had been a Cub Master for 10 years and was then the District Cub Master, Terry knew I enjoyed working with young people. She recommended me for the position. I started in September, 1964, when the Students' Council was located at 11 Maple Avenue. It was called Council House in those days and believe me it was a far cry from what you see here in the Centennial Centre with desks and private offices. We had two desks — one was my stenographic desk and the other was for the whole student body. Crowded at times? Yes. But possibly from this closeness evolved the many activities we had in those days (Folk Song Festival, Literary & Debating Society, Green & Gold Revue, Amateur Nights in the Assembly Hall, Class Plays, and the traditional events held today). I remember the manual typewriter and the hand-operated copier in the kitchen, and I would hang the sheets of copy on the clothesline to dry. Bob Robson was President. I still hear from



Jean Vauthier has many good memories of her years at Macdonald.

members of that Council, as well as those from the next few years, and must admit I look back with great fondness on those first few years that I was here.

Kevin Boushel: I know that you have found things different of late — what do you think has made the biggest difference?

Mrs. "V": Two things come to mind immediately. When I first came, most of the students were living in residence and there was a lot of spirit created in residence that is not found when students are living off-campus. Secondly, when Education left the Campus, the friendly rivalry which existed between Agriculture and Education naturally disappeared. There was much more participation from the Food Science girls then than there is now. There were more traditions and more discipline, and I remember that when changes were first proposed, it was the students themselves who put up the most opposition.

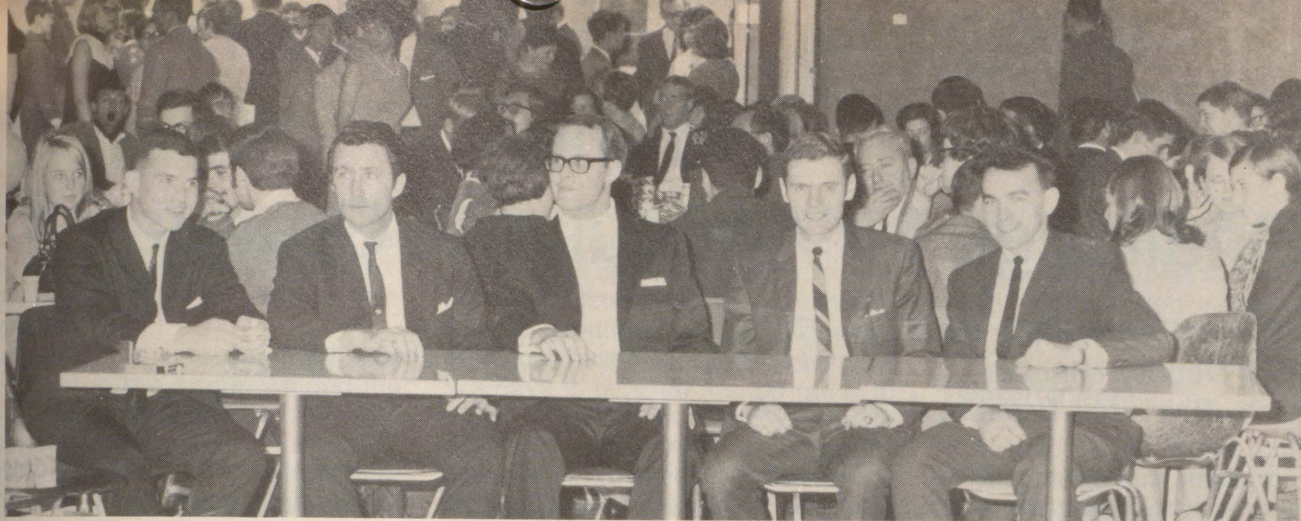
Kevin Boushel: What were some of the "old ways"?

Mrs. "V": The dining hall had a dress code — one was dressed for dinner every night; the boys had to wear shirts and ties. There were special tables for the Seniors. It was a joy to go to Council meetings in those days because everyone looked so smart (I really am dating myself). I remember that the

girls kept looking at their watches during a meeting, because they had to be in by 10 p.m. or they would lose their weekend leaves. The campus was absolutely alcohol-free in those days — the boys went to "Joe's" for fun and frolic. When "Joe's" burned down, the following day was a day of mourning on Campus, with all the boys wearing black arm bands and black ties. It could have been that fire that prompted Bob Robson to work towards a Students' Union Building. I remember when they were discussing the possibility of having beer on Campus, there was again some pretty stiff opposition. The students would come to Council meetings and deliver their platform speeches for and against. The drinkers won by a close margin, resulting in the Ceilidh today.

Kevin Boushel: You mentioned Education?

Mrs. "V": I miss the Green & Gold; I miss the Phys Ed students; I miss the Athletics Demonstration at the Royal, and I miss the Varsity sports — competing with other universities helps to arouse emotions and creates "ye old college spirit." However, one thing I have told the students over the years is that while Ed was here and greatly outnumbered Aggies, the Editor of the newspaper (Fait-Ye Times), the Editor of the Clan, and Council President were always Agricultural students. Another thing that I miss is the Lit & Deb Society. Two Ag students, Geoff Chislett and Clive Edwards, from the West Indies,



The Council Presidents were at the official opening of the Centennial Centre: left to right, Bob Robson, Geoff Chislett, Brian Bonnell, Harold Cooke, and Hugh McClelland.

ere a championship team, defeating McGill, Cornell, and many other universities.

vin Boushel: You mentioned the Student Union Building.

g at the
ecuses. "V": Yes. Bob Robson's Council realized that the students needed more room for activities and decided that the time was ripe for a new building. He had me prepare a cheque for \$20,000 (money that Council had at the time) which was presented to the Principal Rocke Robertson. In the meantime, he had invited the Press and photographers to be present for the presentation. This picture appeared in the local papers and the rest is history. Our generous benefactors contributed the balance. The building opened in the summer of '68 on the site of Diaper Dell. I remember we had the Esso Steel Band — this place was popping.

vin Boushel: You never know how much you appreciate somebody until you try to find a replacement. The position has grown since 1964.

s. "V": There is now a staff of 16 full time and at least 75 casual students. The job has grown tremendously and it is always easier for a person to grow with the job. It has been fun and most interesting (discussing wedding plans with a bride and her mother to cleaning up after a beer party. I guess I am a demanding person, by nature, and students do not always appreciate my motives, but why not strive for perfection in all ventures? Last summer the Lounge was refurbished — it is just beautiful and the students love it. In retrospect, I have spent many, many happy days and



Students pick the corner with "their" sign. The Main, Chemistry, Biology, and Agriculture, which is now the Raymond Building, brass names were removed from the buildings and placed on the walls in the Ceilidh, the students' bar.



The lounge was beautifully refurbished in the summer of '81 and is much appreciated by the students.

happy years in my position on Macdonald Campus, both with the students and staff who are all super.

Kevin Boushel: Plans for the future?

Mrs. "V": We have three granddaughters with whom we would like to spend more time. Tommy and I both love to travel and it will be great to be able to pack and go when we want. I

certainly plan to get back into voluntary work. I know I am going to miss being here and most sincerely it has been a privilege to work on the Macdonald Campus. God bless.

Kevin Boushel: We'll miss you too, Mrs. "V". The many times you have defended our rights, helped us when we got into trouble or had problems, and looked after our interests.

Food, the Universal Crisis and the Challenge for Agricultural Graduates

by Dr. E.J. LeRoux, Ph.D. '54, D.Sc. '73

Assistant Deputy Minister
Research, Research Branch, Agriculture Canada

For the graduate in agriculture there are many exciting and challenging career opportunities, which will grow in number and complexity over the next decade. This is certainly true with Agriculture Canada, which supports one of the major research organizations in Canada — the Research Branch.

The World Food Problem

These opportunities are a result of the world food problem. Today there are about 4.3 billion people on earth and, in just 20 years, it is expected that the population will be over the 6 billion mark, a total increase of about 50 per cent or an increase of nearly 100 million people every year. Whereas there are now about 500 million undernourished people in the world, the figure could be twice that high by the year 2000.

Canada has an opportunity to play a significant role in helping to solve the problems of feeding these people.

Further, Canada's Agri-Food Strategy, designed to expand our agrifood production by 60 per cent by the year 2000, will create opportunities for graduates.

Although I will discuss these aspects of increased food needs in relation to Agriculture Canada, the effects on graduates will be felt in industry, in educational areas, and in our commitments to the Third World.

Canada's Role

Canada can and has contributed significantly to world aid programs. Canada's aid budget was \$1.3 billion in 1981-82. It has been Canada's policy to direct more of its aid assistance to the development of production capability rather than to donations of food.

Adapted from an address given to staff and students at the Macdonald Campus of McGill University, March 31, 1982.

Since the late 1960s, Agriculture Canada, particularly the Research Branch, has become increasingly involved in the management of, or participation in, technical assistance projects to less-developed countries sponsored financially by the Canadian International Development Agency (CIDA).

These projects aim at helping these countries move towards self-sufficiency and are in areas such as wheat research and production, dry land farming, plant protection, and even food processing.

Already our increased international commitments to food aid and technical aid are helping countries to meet their food shortfalls and to devise appropriate technologies for their own food production. Notwithstanding the humanitarian benefits that will accrue from these improved agricultural economies, practical benefits will also come from commercial trade and export opportunities. After all, export is a key to Canadian agricultural growth and trade, simply because the Canadian population isn't large enough to consume all we produce. Last year, Canada exported about \$8.8 billion worth of agricultural products, up a billion dollars over the previous year. Our agricultural imports rose only moderately, to \$5.6 billion, and as a result, the agricultural trade surplus was \$3.2 billion, about half of Canada's total trade surplus.

Agri-Food Strategy

Agriculture Canada estimates that Canada could increase production by more than 60 per cent by the year 2000 and, given expected increases in the real, non-inflated, price of food commodities, the total value of Canada's agri-food output could be doubled in just 20 years. Canada has five times more farmland per capita than the world average, and we have a moral obligation to use it to the optimum

degree. We are now one of only four net food exporting countries. And our role and importance in the world food scene is bound to increase as rising population puts pressure on us to grow and export even more. We must expand the productive capacity of Canadian agriculture. Agriculture Canada, on the request of Cabinet, has developed "An Agri-food Strategy for Canada — Challenge for Growth."

Thus we must set our research priorities to meet future needs.

Future Research Needs

Soils. In view of the limited amount of arable land in Canada, high priority will be given to programs to assess the extent and nature of soil degradation. Such studies will not only examine the effects of erosion in eastern Canada and salinization in western Canada but will also include deterioration of the soil itself due to cultural practices. The productivity of the land resource must be increased within its natural limitations and managed so as to prevent further degradation. For example, nitrogen fixation is a top priority program in the Research Branch which will lead to increased soil and plant productivity and reduced use of fertilizer. More extensive research on land and water management is urgently required to increase production and to deal with problems of soil erosion and salinity.

Plants. Accepting the importance of cereals, oilseeds, forages, and horticultural crops in Canadian agricultural production, it is difficult to foresee any lessening of continuing support of research aimed at improving production, protection, and utilization in these areas. However, there are indications that productivity for some of these crops may have plateaued and that increased production in the future may mainly be achieved by cropping more land. To this end, more support will have to be given to the problem of developing plant species or

varieties that can be grown on marginal lands and within limited environmental conditions, and accelerating northern agriculture development.

Animals. Animal research will also be needed in the future. Among the major challenges, an increase in efficiency of the production of animal products will likely be important since feed presents a large part of the cost of animal production. This could be done through better assimilation of the feed and advances in reproductive physiology.

Food research. Another area of emphasis is in the processing, distribution, and retailing of food products. The objective of this program is to promote increased technical innovation and efficiency in the processing and distributing sectors. We have on-going programs that cover processing technology, new product development, and work pertaining to the physiology and methods of storage of fruits, vegetables, grains, and oilseeds. In food research the demand for protein in human food will likely lead in importance. Many experts warn the protein crunch will ravage in the coming 25 years, even more so than the current energy crisis.

Energy. Energy use is a vital concern to agriculture although less than 10 per cent of the total energy used in Canada is needed to produce food up to the farm gate. A lot of energy goes into the processing and distribution of food. Research will be aimed at developing and transferring new available technology to increase the efficiency of energy use in the production of crops and animals and in the food processing and distribution systems. Energy conservation through better insulation of greenhouses and buildings, interfuel substitution, more efficient machinery and equipment, and the production and utilization of renewable energy are all aspects of energy utilization that need to be investigated.

Protection. People are getting more and more concerned about our environment, pollution, the use of pesticides, acid rains, CO₂ enrichment due to the burning of fossil fuel, etc. Research on integrated pest management and all work related to the protection of our environment and

natural resources has to be in tune with the magnitude of the problems. Systems will need to be developed that will not eliminate but will substantially reduce producers' dependence on chemical pesticides and herbicides. We have to gear up and be ready to move in rapidly when problems arise.

Basic research. Research, however, is not used only to solve problems; it can also be used to provide breakthroughs that open new opportunities. Basic research is a prerequisite to achieving advances. Recently, a new word covering certain aspects of basic research has been invented: biotechnology.

Crop improvement has traditionally been based on manipulation of plant populations by selecting superior genotypes. Genetic engineering makes a replacement of the "numbers game" by restructuring the genetic architecture of the plant itself in a highly precise manner.

We can now clone multiple copies of specific genes from a plant in a bacterial system such as *E. coli*, purify the gene in large quantities, which then can be chemically analysed. Thus the base sequence of the gene can be determined and in turn be used to ascertain the amino acid sequence of its protein product. With computer simulation we can then predict the structure of the protein molecule *in situ*. This kind of research is essential to fully exploit recombinant DNA technology.

Processes and products related to agriculture which could be improved through the application of biotechnology include: cellulose utilization, treatment and utilization of agricultural wastes, biochemical production (vegetable oils for plasticizers), development of pest control agents, bioproduction of liquid and gaseous fuels, and single cell protein. New products and more energy efficient processes will be derived.

The Research Branch of Agriculture Canada is in a position to expand its existing programs using biotechnology and, in this way, increase their potential for improving the nation's crop production capacity. The 5-year plan for biotechnology will require a minimum of 109 new positions. They will be principally in the areas of molecular biology, microbiology, and plant and

animal biochemistry and genetics.

All this research will contribute to increase our Canadian agricultural production and efficiency and widen our product base.

Research Branch

In addressing these challenges, Canadian Agriculture has the responsibility to provide leadership as our industry enters a new era of expansion and development, an era based upon growing market opportunities, an era in which our future growth must provide adequate supplies of food not only for ourselves but also for our fellow members of the world community.

The Research Branch has some 3600 employees, of which 900 are in the scientific and professional category, and has an annual budget of \$177 million for 1982-83. The salary of scientists ranges from about \$23,000 to \$56,000.

Management in the Research Branch supports very strongly the development and training of its employees. We have, at this moment, over 30 employees on educational leave across the world studying to obtain their doctorate degree. Deans of Faculties of Agriculture in Canada will be asked to look at the availability of graduate students, and we intend to hire 60 additional researchers as soon as they become available.

Canadian agriculture in the 80s will require all the highly qualified manpower that Faculties of Agriculture can produce. Graduates at Macdonald will be singularly blessed with job opportunities like few graduating classes before. There will be opportunities to produce more food for more people. There will be job opportunities in producing new technology and job opportunities in biotechnology, in chemical support, in economics, in land science, in energy, and in policy making. Vacancies are available today. Tomorrow there will be more. Young graduates will succeed in their careers, whatever the climate of their seasons, if throughout they will only follow the good advice of Henri Bergson, the French philosopher — "Think like a man of action and act like a man of thought." I cannot help but be confident that for all of us the best is yet to come.

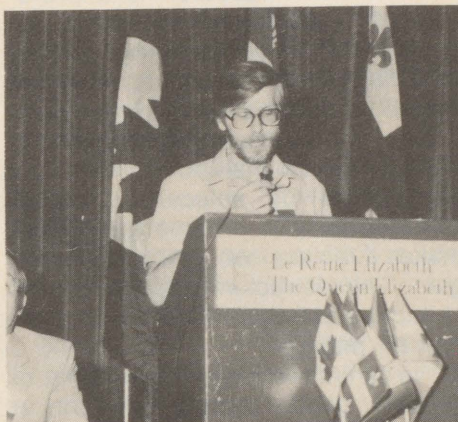
Canadian Institute of Food Science and Technology

by Professor Edmund S. Idziak
Department of Microbiology and School of Food Science

The Montreal section of the CIFST hosted this year's meeting which was held at the Queen Elizabeth Hotel from May 31-June 3, 1982. The theme for this Silver Anniversary Meeting was EXPANSION, and the program was developed to deal with Canadian export of goods, services, and technologies both within Canada and around the world. To this end delegates from Canada, the United States, Europe, South America, the Middle East, Africa, and Japan met in Montreal to discuss their recent developments and advances in the area of Food Science and Technology.

The Honourable Eugene F. Whelan, Minister of Agriculture, gave the keynote address on EXPANSION — THE WAY AHEAD. The Minister noted that Canada has the capability to increase food production by two-thirds and that by the year 2000 our exports of food products should double. In 1981 we had a trade surplus of \$3.2 billion in agricultural and food products. Nevertheless, there was a slight deficit in the trade balance in the area of processed foods. We are primarily exporters of raw materials, and we should look to processing more of our food production prior to export.

To accomplish this we require dedicated trained personnel and monies to develop innovative processes and products. By the year 1986, 400 new agricultural and food scientists will be required to replace those expected to retire or resign from their present positions. Food industries will have to spend more on research and development (R&D) and equipment renewal to keep pace with industries in other countries. At present only 0.1 per cent of sales goes to R&D; this is sevenfold less than the average of other industries in Canada and substantially lower than the amounts



Conference Chairman, Dr. E.S. Idziak, B. Sc. (Agr.) '56, M.Sc. '57, during the official opening of the Congress.

spent in other countries. In addition, 15 to 20 companies account for 80 per cent of this R&D budget. Mr. Whelan intimated that new food research facilities should be built in Ontario, Quebec, and British Columbia where so much of Canada's food processing is based. The government has set up several agencies to assist companies in exporting their products. One of these, CANAGREX (Canadian Agricultural Export Corporation) will aid companies seeking export markets and help Canadians negotiate in the international market place.

Mr. M. Heney (Director General, Food Branch, I.T.T., Ottawa) described in detail the various services and agencies within the federal government that are prepared to assist industry in the quest for export markets.

The theme that Canada must move to a broader based export of finished food products was reiterated and further stressed by Mr. E. Holmes, (Vice-President-Planning, A.C. Nielsen Company of Canada). He emphasized that there has been no substantial change in the past 20 years regarding our food export profile; principally, we still are

exporters of primary or raw materials. The obstacles to increase exports of finished food products are great but no greater than the problems experienced by the Japanese in 1960 when they began to export their cars to the North American market — and look at them now.

The industry viewpoint of expansion potential and capability was summarized by Mr. Guy St. Pierre (Senior Vice President, John Labatt Ltée, Montreal). Although accepting that there are many diversified government programs and services to assist industries in their drive for export markets, few of them are useful to the agricultural and food industries. For these services to be of significant use to the food industry, Mr. St. Pierre stated that it is essential that government officials meet with industry personnel to establish priorities for export as well as to establish workable rules and regulations under which the programs would operate. Without these consultations, there will not be any significant progress in increasing our exports of Canadian food products, processes, and technologies.

Other major symposia organized by the Conference Committee included:

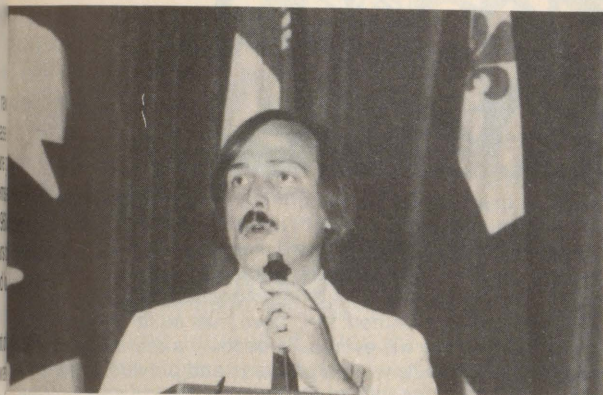
1. International Trends in Food Science and Technology with prominent food scientists from seven countries discussing developments and potential expansion in their area of the world;

2. Ultrafiltration and Reverse Osmosis in which Canadian applications and problems were discussed, recent developments in the field explored, and a review of the equipment available presented, and

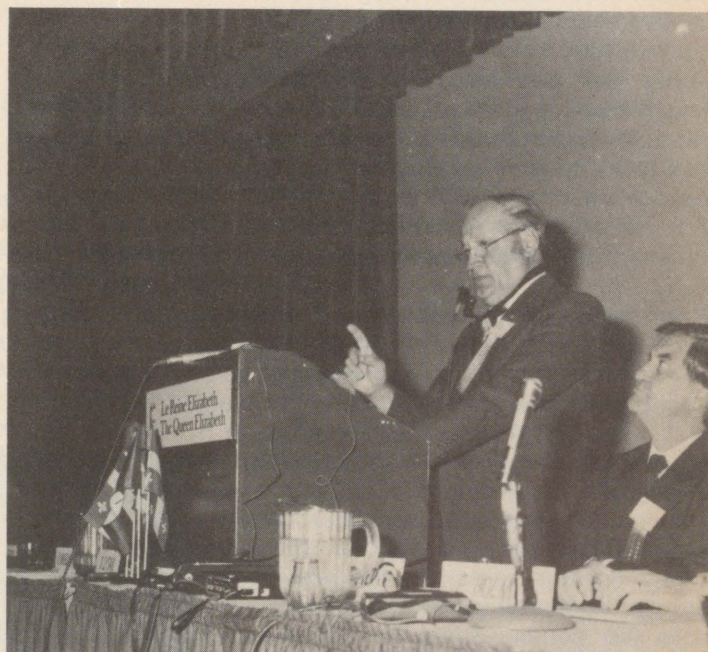
3. Applied Biotechnology wherein the delegates were exposed to aspects of embryo transfer, tissue culture for virus elimination, nitrogen fixation



Members of the International Symposium on Food Science and Technology, left to right, Dr. G. Dardenne, France; Professor M. Fujimaki, Japan; Dr. R.H. Moretti, Brazil; Dr. J. Hulse, Canada; Dr. J.E. Kefford, Australia; Dr. A. Rutkowski, Poland; Dr. R.L. Hall, United States.



Mr. Graham Worden, B.Sc. (F.Sc.) '75, Chairman of Montreal Section, welcoming the delegates.



The Honourable Eugene F. Whelan, Minister of Agriculture, making a point. Mr. Guy St. Pierre, Vice President, John Labatt Ltée, looks on.



Sylvain Gauron, B.Sc. (F.Sc.) '82 receiving the Undergraduate Student Award from Martin Stauvers, President of CIFST.

Macdonald staff and students from various disciplines and departments were deeply involved in the organization and operation of this very successful meeting. Hélène Deutsch and Nancy Crowe, graduate students in Food Science and Chemistry, did an outstanding job in putting together a scientific and social program for the students from across Canada. One of their events included a tour of the Food Science facilities on the Macdonald Campus. Professor T. Beveridge and Ms. Karen Lapsley (Food Science) were members of the Technical Committee and were instrumental in the smooth running of the technical program. Professors R. Kok (Engineering), G. Paquette (Chemistry), and Shirley Weber (Food Science) chaired technical sessions. Professor T. Smyrl (Food Science) served as secretary of the Conference Committee, and Professor E. Idziak (Microbiology and Food Science) was the Conference Chairman.

enhancement using DNA recombinant techniques, and commercial production of vegetables in enhanced environments.

In addition, over 100 technical papers in the areas of food chemistry and biochemistry; meat, fish, and poultry; sensory evaluation; microbiology; dairy and edible oils, and food processing and engineering were presented by leading food scientists and graduate students. There was also a graduate student competition for the best paper presentation at the meeting. This award went to V. Molund from the University of British Columbia for his work on "Binding properties of melanoidins." Another award for the best undergraduate student paper went to our student in the School of Food Science, Sylvain Gauron, for his research on "Evaluation of government laboratory techniques for the microbiological analysis of a frozen fish product."

Forty-five companies exhibited their new products/processes or equipment and apparatus to be used in the plant, quality control laboratories, and in R&D facilities.

Approximately 900 delegates attended the meeting — 62 per cent from industry, 28 per cent from universities and technical schools, and 10 per cent from government.

Seeking Solutions

Personal financial knowledge; how it is obtained and used will be the subject of a study by **Ms. Lanita Carter** of the School of Food Science. The way households manage their finances may be a result of age, occupation, job status, and education. Do rural people have more financial knowledge due to involvement in complex farm business operations? Ms. Carter hopes her study will identify strengths and weaknesses in financial knowledge in rural and urban populations. Specific needs of specific groups within the population as a whole may be found. It is hoped improved consumer education in this area will result.

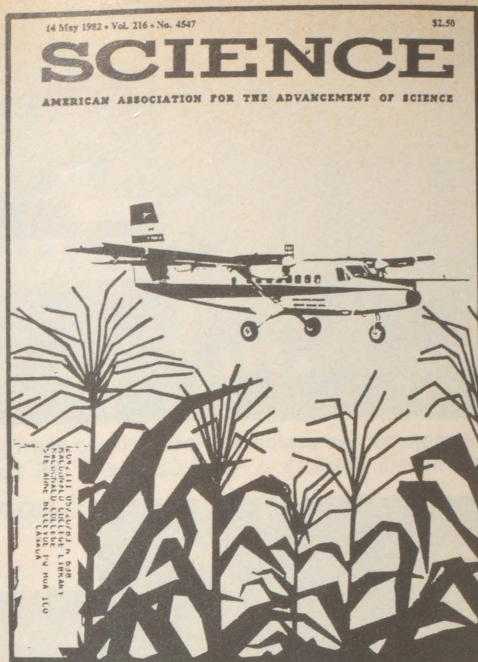
Professor B. Coulman (Plant Science) has begun work on a new breeding procedure for red clover that could result in cultivars with improved winter hardiness. His research will investigate the possible formation of synthetic cultivars. According to Professor Coulman, the growth type of individual plants (basically the degree of production of flowering stems) in the year of seeding is related to winter hardiness, with the non-flowering types being more winter hardy. Recently produced cultivars that are adapted to eastern Canadian conditions have had a tendency towards a higher proportion of non-flowering plants. In this study, poly-crosses composed of varying proportions of plants of growth types 0 (strong rosette), 2 (weak rosette, some flowering stems), and 4 (no rosette, profuse flowering) will be made. Seed will be planted in a field study to compare the productivity and persistence of the synthetics produced.

Professor R. Kok (Agricultural Engineering) has recently received funding from the Natural Sciences and Engineering Research Council of Canada to develop software for on-farm computers used for farm management decisions. An intelligent, friendly, and simple-to-use farm management program package will be developed that could run partly on a farm microcomputer and partly on a large mainframe computer. Professor Kok feels that this approach will be most convenient and least costly for the farmers.

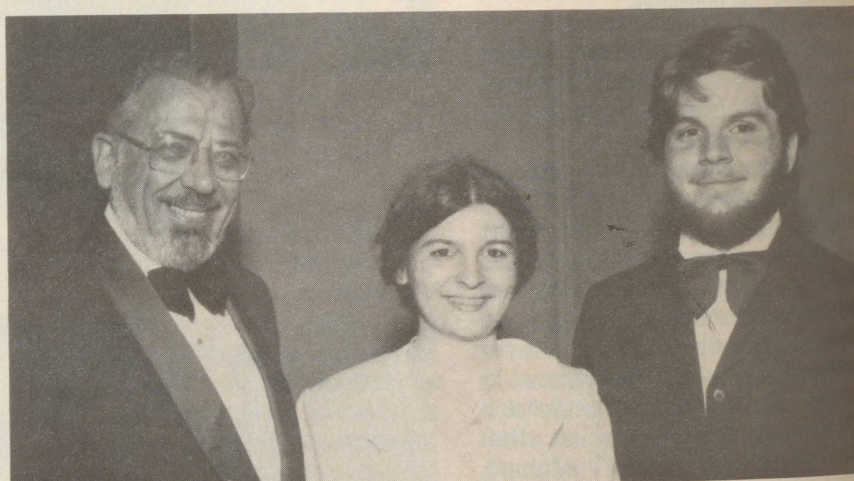
Professors L. Phillip (Animal Science) and **A.F. MacKenzie** (Renewable Resources) have just received renewed funding from the Potash Corporation of Saskatchewan for their study on potash-nitrogen fertilization and corn silage quality. Their work has been expanded to include field fertilizer trials and silage quality measurements. Laboratory micro-silos have been used to ensile 500 grams of material for chemical studies, and now mini-silos are going to be used to

produce 500 kilograms of silage for sheep feeding trials. Thus the effects of fertilizer use will be followed all the way from corn yields in the field, through laboratory studies of silage quality at precise oxygen and temperature levels, to metabolic studies on animals using the experimental silages.

Professor Phillip is particularly interested in following the soluble nitrogen fraction in the forage at high fertilizer levels, and also in seeing if



SCIENCE, probably the most widely read international journal on new scientific developments, featured as its May 14, 1982, cover story an account of the work done at least partly at Macdonald: attempts to measure CO_2 exchange from crops, forests, and lakes to air from low-flying aircraft. This project, carried out jointly by Professor P. Schuepp and graduate student P. Alvo, from the Department of Agricultural Chemistry and Physics, and staff from Agriculture Canada and the National Research Council's Flight Research Establishment in Ottawa, has so far produced the world's first successful attempts at what many hope will eventually become a routine procedure for measuring biomass production of fields and forests over large areas and provide some clues as to what the earth's ecosystem is going to do in the face of the ever increasing concentration of CO_2 in the air.



Odette Ménard (centre) and Jérôme Couture (right) were recently awarded scholarships established by the relatively new Food and Nutrition Research Foundation. The recipients of this scholarship must have high academic standings and show a serious quest for new knowledge in human nutrition, food chemistry, or food engineering. Miss Ménard has completed her second year in the Agricultural Engineering program and Mr. Couture his second year in the Food Science program, food chemistry orientation. They are accompanied by Dr. Jean David, Associate Dean, Student Affairs and Public Relations.

Canadian Farm and Industrial Equipment Institute

by Professor E. McKyes,
Department of Agricultural Engineering
and Brent M. Hamre, General Manager, CFIEI

The Canadian Farm and Industrial Equipment Institute (C.F.I.E.I.) is an important agribusiness association since it comprises a strong single voice for a key industry in Canada's agricultural production. The Institute performs such services as negotiating in legislative dialogues, providing public relations for the equipment industry, and compiling sales statistics for both public and internal uses. It is fitting that the Institute chose the Chateau Champlain Hotel in Montreal for its 15th anniversary meeting because it is the same location as the first complete conference for delegates and spouses which was held in 1968.

Delegates attending the meeting this year represented the 35 active manufacturing and distributing member companies of the Institute, together with 56 associated member companies supplying components and services to the member manufacturers. The members are organized also into 13 standing committees in the Institute which study such matters as customs and excise, traffic and transport, equipment safety, statistics, marketing, public relations, and the like.

The theme of the conference was Canadian Agriculture — Future Perspectives, and the roster of speakers who presented talks to this theme were chosen from different sectors of the agricultural scene. Mr. Robert Hanson, President of Deere and Company, and Chairman of the Board of the American Farm and Industrial Equipment Institute, from the manufacturer and distributor sector, illustrated some of the ways in which the equipment institutes focus their activities on the current needs and problems of the member companies. Mr. John Zaluski, President of the Canadian Federation of Farm Equipment Dealers, discussed individual equipment dealers' business practices and financial situations. Mr. Peter Twynstra, a leading southwestern Ontario farmer, spoke about the increases in farm sizes and worth in recent years in light of the present difficult economic times. The Honourable Eugene Whelan, Minister of Agriculture of Canada, rounded out the program theme at the June 15th luncheon by summarizing the achievements of Canadian farmers and equipment manufacturers, together with the government agencies and legislative liberties which help them, and giving an optimistic prediction for the agriculture industry over the next 10 years.

The conclusion of all the speakers at the Conference was quite clear. Canadian agribusiness is indeed going through difficult times and will probably continue to do so in this calendar year. However, the key point made by each was that there is a bright future, and all the companies involved must work together to meet the challenge of providing the machinery and equipment needed to produce the food and fibre required for the world's ever growing population. The delegates thus came away from the Conference with hope for the next few years and a resolve to remain as efficient as possible now in order to be able to provide very high productivity when markets pick up again in the future. They also came away from the Conference with the memory of a very well organized combination of enjoyable social gatherings and excellent business sessions.

Disease Control Through Foliar Nutrition

by V. Goss and W.D. Marshall
Department of Agricultural Chemistry and Physics

Chemicals used in the control of plant diseases may act to reduce, remove or eliminate inoculum at the source (eradication); to prevent disease (protection); or to cure them (therapy). The great majority of chemical control measures involve the principle of protection which requires preventing inoculum from entering the host and starting infection. To accomplish this the chemical may be used to prevent growth of sporulation of microorganisms or to kill or inactivate the inoculum at the site of infection.

A tantalizing new development in the science of crop protection would be the development of a foliar feeding solution (a fertilizer formulation designed for foliar application) which would possess anti-fungal properties. This material would include a component which would be selectively toxic to fungal pathogens. Alternatively this formulation would contain a fungal inhibitor which would protect the host plant from fungal pathogens and which would be subsequently biodegraded to furnish the plant with nutrients. The concept of controlling crop diseases through foliar nutrients is ecologically sound.

Although the development of these formulations may represent long-range goals of many research programs the world over, more immediate objectives might be defined. These would include the development of nutrient formula-

tions which are compatible with commercial fungicides or the development of a fungicide carrier solution or "extender" composed of plant nutrients. We are convinced that formulations can be developed whereby the biological action of one component does not act to the detriment of the second component. As an initial approach to such a program we were asked to develop and apply a series of laboratory bioassays which would allow us to assess anti-fungal activity of various formulations. We were particularly interested in evaluating combinations of inhibitors and in assessing the interactions (if any) of one inhibitor with another. Specifically we required an experimental probe which would detect synergistic interactions (the phenomenon whereby one chemical increases the biological activity of another) or the opposite effect, antagonistic interactions.

Screening techniques (bioassays) to identify chemicals as potential "fungicides" are legion and diverse in both nature and scope. We are using two standard mycological procedures to assess the inhibiting action of a test material at various dosage levels on the vitality of pathogenic fungi. These assays measure the inhibition of mycelial propagation (vegetative growth of the fungus) or spore germination (conversion from a survival stage to a phase of vegetative growth).

As test organisms we chose three fungal pathogens which are of economic importance to tomato production. Although tomato production for commercial processing is rather restricted geographically in Canada, it represents a major crop in southern Ontario where there are over a quarter of a million acres in active production. It represents an intensively cultivated crop in which contracts between growers and processors stipulate a regimen of successive applications of fungicides throughout the growing season. A fertilizer-fungicide combination would be an attractive alternative to current practices. Thus we have chosen to work with wild isolates of *Botrytis cinerea* responsible for grey mould and stem rot; with *Colletotrichum coccoides* which causes anthracnose and with *Septoria lycopersici* which is responsible for "Leaf Spot" and "Septoria Blight."

These fungi are readily cultured on synthetic media and are amenable to laboratory bioassays. Our procedure has been to establish dose-response (inhibition) curves for test materials by incorporating the material into the nutrient medium which supports fungal growth. A viable mycelial disk of the fungus is transferred to the test medium (nutrient and test substance) and growth, relative to controls, is measured after one, two, three, and four days. Minor modifications to this

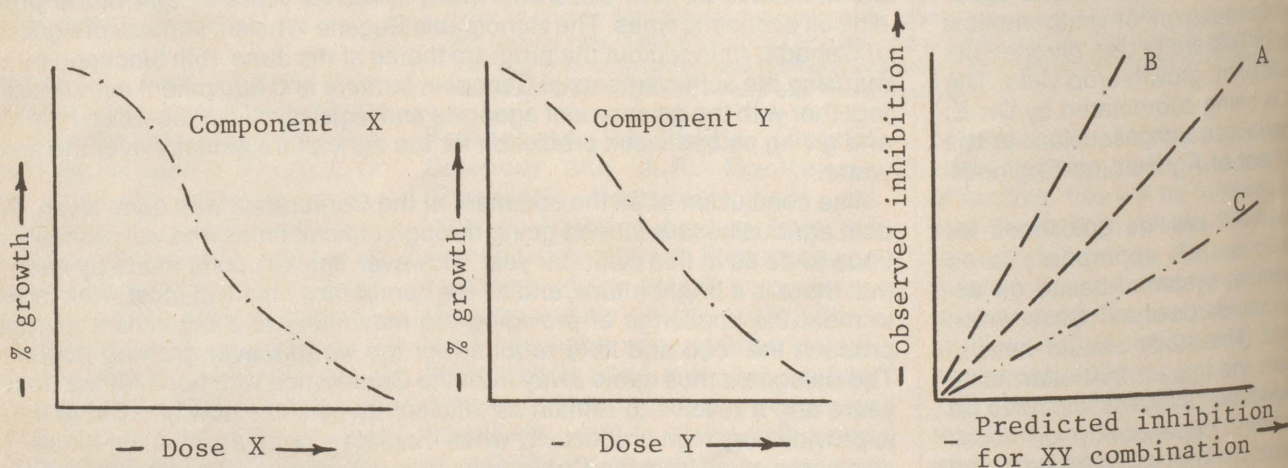


Figure 1. Statistical evaluation of interaction between combinations of inhibitors.

cedure allow us to access spore germination in liquid culture. Arbitrary germination is considered to have occurred if the length of emerging germ tube exceeds the diameter of the original spore by 50 per cent. Interactions between combinations of inhibitors are studied by repeating the assays using combinations of inhibitors and comparing the observed inhibition with the predicted inhibition of individual components of the mixture (additive effects). Plots of predicted versus observed inhibition for various combinations of the two components are generated in a series of replicate assays. Statistical regression analysis of the data points results in "best fit" straight lines which have a slope greater than one if synergistic effects are operative (Curve B, Figure 1) or less than one if the interactions are antagonistic (Curve C, Figure 1). The degree to which the slope deviates from 1.00 is a measure of the magnitude of these effects. Changing responses with time can sometimes be related with chemical degradation of one of the components.

Mycelial disks (or spores) are routinely transferred to fresh medium containing no inhibitor in an attempt to re-induce growth (spore germination).

WORLD FOOD DAY

WORLD FOOD DAY was first observed on October, 1981, on the 36th Anniversary of the founding (in Quebec) of the Food and Agriculture Organization (FAO) of the United Nations. In establishing this observance, FAO stated the overall goal is to "develop a sense of national and international solidarity in the struggle against hunger, malnutrition, and poverty." As food production and consumption represents the major emphasis of Macdonald, it is planned that World Food Day (or days) become an annual major campus activity involving staff and students and extending to surrounding communities.

The Macdonald Campus World Food Day Committee has started to organize for that big event that will take place this October. Look forward to the next issue of the Journal for a report on the World Food Day '82 observance at the Macdonald Campus.

tion). This procedure allows us to designate the activity of the test substance as "fungi-toxic" or "fungistatic" (growth resumed). Further modifications of the assay procedures have permitted an investigation of the antifungal action of volatile components of formulations and to separate these effects from non-volatile inhibitors. In these modifications the mycelial disk on nutrient agar is maintained in close proximity to the test mixture in a sealed chamber. Residual activity is measured in the standard assay after the mixture has been exposed to air for long periods.

To date our studies have been restricted to combinations of "foliar feeding" formulations with classical protectant fungicides. The limitations of these non-systemic fungicides are all recognized. They offer no protection after fungal penetration of the plant, are ineffective against root and vascular diseases and are subject to weathering and washing off. However, they have a significant advantage in that they are inhibitors of rather general cellular processes; they inhibit by "multi-site" mechanisms. This mode of action contrasts the action of most systemics which inhibit specific biochemical processes. Thus there is considerably less tendency to develop

race resistance due to selection from natural habitats of fungal strains.

Although the results of these studies rightfully remain the property of the company sponsoring this research we have been encouraged by our findings. We have studied a high phosphate formulation in combination with Chlorothalonil (2,4,5,6-tetrachloroisothalynitrile) or with Dichloronitroaniline (DCNA) and have not observed any evidence of interaction. Combinations of these formulations with metals have been somewhat less successful leading in some cases to antagonistic effects. Nonetheless the anti-fungal activities of the foliar solutions themselves hold considerable promise for these materials.

Laboratory assays are not always a good indication of the effects in actual field trials. Specifically they will not detect phytotonic effects; a stimulatory effect on the host plant which is quite independent of the normal disease control mechanism. The application of nutrients it is hoped will increase host resistance. Thus our bioassay studies represent only the first step in the assessment of fertilizer-fungicide combinations. Nonetheless they can provide a valuable indication of interactions.



FOOD SCIENCE STUDENT EXCHANGE: The Canadian University Exchange Program, Secretary of State, Ottawa, funded the academic exchange between McGill (Macdonald Campus) and the University of Alberta of 11 Food Science/Chemistry students and one staff member from each University. K. Lapsley and the Mac students visited Edmonton and Calgary areas for March mid-term break and toured beef processing and ethnic foods plants, aseptic milk packaging operation, and government labs. The U of A students came here late April and visited Agro-pur, Comet Confectionary, Hoffmann Laroche, Labatt, Ogilvy Flour Mills, Seagrams, and Sodispro. Social events were also organized.

The Excess Fat Problem in Broiler Chickens

by David Laurin, Hugh Dimock, and Sherman Touchburn
Department of Animal Science

The broiler chicken of today represents a near-miracle of improved growth rate and efficiency of feed utilization — an excellent example of the accomplishments possible through agricultural research and its practical application by a dynamic industry.

In 1946 broilers took 14 weeks to reach a live weight of 4 pounds. Figures available for 1951 show weights of 3.7 pounds at 12 weeks of age. These birds ate almost 3 pounds of feed for each pound of weight gained (Biely *et al.*, 1971). Today our broilers average well over 4 pounds by 7 weeks of age and need less than 2 pounds of feed for each pound gained!

One sour note in this performance is that today's broiler is too fat. This is the unforeseen result of 35 or so years of breeding and selecting exclusively for ever-more-rapid growth. It occurred because there turns out to be a positive inherited relationship between growth rate and fatness. Modern high energy concentrated feeds are also contributing to the problem.

Consumers complain about the excessive fatness of carcasses, particularly about the layer of fat just inside the rear of the abdomen and about the weight loss due to rendered fat on cooking. Operators of poultry slaughtering plants, too, are unhappy with this extra fat. Some supermarket chains demand the removal of the apron of abdominal fat from the carcass. This requires an additional step on the processing line and a further loss to the processor when he receives 2 or 3 cents for this fat as salvage after paying 48 cents per pound for it when he buys the live bird. The fried chicken restaurant operators find that the extra fat dilutes their cooking oil and thus reduces its duration of use. The broiler grower himself is penalized because it costs much more to produce fat than it does to produce the protein and water which it replaces.

Leclercq *et al.* (1980) in France selected from a base population two lines of chickens, one for fatness (fat line, FL) and one for leanness (lean line, LL). They did this by selecting



Postgraduate student David Laurin, who is working towards his Masters, is shown with one of the hens imported from France for further research.

parents only on the basis of the proportional weight of the abdominal fat in their progeny. While on sabbatic leave in France, Professor Touchburn collaborated with the French workers in studying the third generation of these selected lines. That research demonstrated that the degree of fatness of both genetic lines could be altered somewhat by manipulating the levels of energy and protein in the diet and the calorie: protein ratio. However, the FL birds always remained much fatter than the LL (Touchburn *et al.*, 1981). This tells us that the ultimate solution will be through breeding and selection over the long term while the dietary and management approaches will be important both immediately and in the long term.

We recently imported chicks of the F₆ or sixth selected generation of FL and LL birds from France. With financial support from le Ministère de l'Agriculture du Québec and the Natural Sciences and Engineering Research Council of Canada we are continuing this research.

Questions we will address include Does added fat in the feed contribute to the problem or is it simply a matter of total dietary calories? Touchburn *et al.* (1981) showed that the FL chickens produce more insulin than their LL counterparts, thus explaining why they are fatter, since insulin is known to stimulate fat synthesis. This is similar to the situation in pre-obese human so interest in our work becomes much broader. It is obvious that we have an excellent situation for studies of lipid synthesis and body composition of interest to both animal agriculture and human medicine.

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HOUSING TURKEY MALES IN CAGES

by G.A. Ansah, R.B. Buckland, C.W. Chan, and S.P. Touchburn
Department of Animal Science

Traditionally, producers of turkey hatching eggs keep the breeder males on litter floors and periodically catch them to collect semen for artificial insemination. The inconvenience and problems associated with floor housing such as the exposure of personnel to a dusty atmosphere, poor sanitary conditions for the birds, and the stress imposed on the birds during catching are of great concern to the turkey producer. These problems can be alleviated by housing the males in individual cages, but a suitable design, particularly of floor type, is needed.

If such a management system (cage housing) for males could be shown to be feasible and economical, it would be readily adopted by the industry. However, it must be clearly demonstrated that males in cages will produce an adequate quantity of high quality semen which will result in high levels of fertility and hatchability throughout the breeding season.

A study has been conducted at the MacDonald Campus of McGill University in which comparisons were made of reproductive performance, body weight, leg problems, and mortality between males housed on litter floors and those in individual cages (measuring 60 x 60 x 90 cm). The floors of the cage were made up of two sections of white plastic Vigortone's slotted "litter eeze" flooring (30 x 60 cm).

Table 1. Effect of housing system on fertility and hatchability from fresh turkey semen and that stored for 6 hours at 15°C or 3°C.

Semen Storage	Housing Type					
	Floor			Cage		
	Fresh	6h-15°C	6h-3°C	Fresh	6h-15°C	6h-3°C
% Fertility	88.43	83.57	85.10	91.88	79.31	76.62
% Hatchability	48.44	48.15	48.26	49.59	41.50	46.96

Table 2. Effect of housing system on semen characteristics, body weight, leg problems, and mortality of male turkeys.

Housing Type	Semen Volume (ml)	Spermatozoa Concentration (1×10^9 ml)	Body Weight (kg)	Leg Problem (0-3) ¹	Mortality (%)
Floor	0.18	9.74	11.3	0.3	3.4
Cage	0.19	9.91	10.6	1.7	24.6

¹Severity scored from 0 for normal to 3 for maximum abnormality.

Referring to Tables 1 and 2, we see that housing turkey males in these cages did not have any detrimental effect on per cent fertility or per cent hatchability with either fresh or stored semen, nor was there an effect on either semen volume or the concentration of spermatozoa. Cage housing, however, did cause a reduction in body weight and a higher incidence of leg problems which perhaps led to the higher mortality rate observed during the production cycle.

These results indicate that although cage housing of turkey males on plastic floors may not adversely affect their reproductive performance in com-

parison to those housed on litter floors, it can cause a high incidence of leg problems and a higher mortality in the males during the production cycle. Thus, more research efforts must be directed towards the design of individual cages, particularly floor type, before recommendations can be made. Perhaps even more important in developing a cage management system for turkey males is the age at which birds are placed in the cages. Some of our observations and those of other researchers suggest that exposing birds to a cage environment at a young age may reduce the problems encountered.

How often should semen be collected?

G.A. Ansah, R.B. Buckland, C.W. Chan, and S.P. Touchburn
Department of Animal Science

Artificial insemination has been practiced by commercial turkey hatching producers for a number of years. This is because fertility from natural mating in turkeys is either nil or very low while fertility from artificial insemination may be as high as 95 per cent during a large part of the breeding season.

In turkeys, the amount of semen produced per ejaculation is small. As all turkeys today are produced by artificial insemination, it is a great economic advantage if the producer can manage the male so as to ensure the maximum volume of a high quality semen which, in turn, will ensure high fertility and hatchability throughout the reproduc-

tive cycle. The management of the males to produce a high volume of good quality semen leads to an increase in the number of hens that can be inseminated per ejaculate and in a reduction in the number of males that a producer must keep.

Currently in the industry, turkey males are used for semen collection at

a frequency varying from bi-weekly to twice per week. Frequent semen collections are known to cause reductions in semen volume per ejaculate but the total number of spermatozoa may not be affected. The question which the producer asks and which we have addressed at Macdonald is: What is the most efficient frequency of semen collection for turkey males to maximize total live spermatozoa yield, fertility, and hatchability?

We subjected males to semen collection frequencies of either once a week (Wednesday), three times a week (Monday, Wednesday, Friday), or five times a week (Monday, Tuesday, Wednesday, Thursday, Friday). In 1 week, semen yield was measured and, in alternate weeks, hens were inseminated with 0.02 ml of fresh pooled semen from males subjected to each collection frequency to determine fertility and hatchability.

The results of this work are presented in Table 1 and one observes on a per ejaculate basis that as the frequency of semen collection increases, semen volume, spermatozoa concentration, and per cent live spermatozoa decrease while per cent abnormal spermatozoa increases. These declines are particularly marked for

males collected five times weekly. It can also be seen from Table 1 that there are differences in the fertility and hatchability levels in relation to semen collection frequency. Collecting semen from turkey males three times per week results in a higher level of fertility than if semen is collected either once or five times weekly. Per cent hatchability appears to be lower for embryos fertilized by spermatozoa from males whose semen was collected five times per week as compared to those under collection frequencies of once or three times per week.

Let us now examine the results on semen quality presented in Table 1, not on a per ejaculate basis but rather on a yield of live spermatozoa per week basis. If we consider semen

volume, semen concentration, and per cent live spermatozoa, we find that by setting three semen collections per week at 100 per cent, then for once a week semen collection, the total live spermatozoa yield is 51 per cent while for five semen collections per week a value of 77 per cent is obtained. The higher percentage of abnormal spermatozoa from males whose semen was collected five times a week further penalizes them. Thus, a collection frequency of three times a week maximizes total yield of live spermatozoa. Thus, based on the semen collection frequencies examined in this work, the most desirable semen collection frequency for producing turkey hatching eggs is three times per week as it maximizes both the production of live spermatozoa and fertility.

Table 1. Effect of frequency of semen collection in turkeys on their reproductive performance over a 16-week period.

Frequency of Semen Collection	Fertility (%)	Hatchability (%)	Semen Volume (ml)	Spermatozoa Concentration (O.D.)	Live Spermatozoa (%)	Abnormal Spermatozoa (%)
Once per week	82.8	65.8	0.34	0.44	82.6	34.0
Three times per week	89.1	65.5	0.25	0.40	80.4	34.5
Five times per week	85.7	61.6	0.15	0.33	75.2	38.6

To maximize fertility in turkeys: how often should the female be inseminated and with how many spermatozoa?

by G.A. Ansah, R.B. Buckland, C.W. Chan, and S.P. Touchburn
Department of Animal Science

With respect to practices utilized in artificial insemination in the turkey industry, there is much variation as to the number of spermatozoa or semen dosage per insemination and the frequency of insemination. There is no general agreement among researchers on either of these points to maximize fertility and to make the most efficient use of the semen. This lack of general agreement is perhaps because these has been very little

work done to define the optimal insemination frequency, as it is in turn affected by the number of spermatozoa inseminated per insemination. The frequency of insemination and the number of spermatozoa inseminated are very much interdependent since the actual number of spermatozoa in the spermatozoa host glands of the female affects, to some extent, the length of time post-insemination over which a high level of

fertility can be maintained. That is, after a single insemination, a turkey hen stores spermatozoa in her sperm host glands and releases them over a number of days to fertilize the subsequent eggs and the effectiveness of this depends on the number and quality of spermatozoa in the sperm host glands. For undiluted semen, there are reports in the literature that weekly seminations of between 45 and 200 million spermatozoa result in maximum

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um fertility while, for diluted semen, million spermatozoa are required to inseminated weekly.

To address this problem, we have studied the effects of spermatozoa number and insemination frequency on the fertility and hatchability of keys in a attempt to determine optimal insemination frequency in relation to the number of spermatozoa per insemination; the results are shown in Table 1.

Insemination once per week results in higher fertility than insemination every two weeks. Furthermore, we see that, in both cases, 50 million spermatozoa per insemination result in higher fertility. There is, however, no difference in fertility when either 100 or 200 million spermatozoa are inseminated. We expected this lack of

Table 1. Effects of spermatozoa number and insemination frequency on turkey fertility and hatchability.

Spermatozoa No. (1 x 10 ⁶)	Fertility (%)	Hatchability (%)
	A.I.	
	Weekly	
50	82.1	67.7
100	88.7	65.2
200	90.5	67.9
Mean	87.10	66.9
	A.I.	
	Bi-Weekly	
50	73.0	56.5
100	80.8	63.0
200	77.6	68.7
Mean	77.11	62.8

difference between 100 and 200 million spermatozoa for weekly inseminations but, for inseminations every other week, we actually ex-

pected the use of 200 million spermatozoa to be superior to 100 million. Our results show that, with diluted turkey semen, optimum fertility can be obtained with weekly inseminations of not more than 100 million spermatozoa.

Weekly or bi-weekly inseminations have no effect on hatchability, but the number of spermatozoa inseminated appears to be important, particularly when inseminations are bi-weekly, in that as the number of spermatozoa inseminated decreased so did the hatchability.

Thus, the results indicate that, for optimum per cent fertility and hatchability, a minimum of 100 million spermatozoa should be used per insemination and the frequency of insemination should be once per week.

Energy levels and calcium sources in turkey hen diets

Judy Thompson, C.W. Chan, G.A. Ansah, R.B. Buckland, and S.P. Touchburn
Department of Animal Science

keys are notoriously poor producers and the fact that day-old chicks are two to three times the price of day-old chicks adds to the cost of turkey dinner. The companion article by Ansah and coworkers reports progress relating to male fertility. Since much of the problem can be attributed to the hen, the following report relates a portion of the project in which we studied two factors in the hen's diet through which it was hoped to increase the number of poults produced. These were the energy level and the form in which calcium was supplied in the diet. The experiment involved the Lignébecoise, a medium sized broiler developed and widely used in Quebec.

The National Research Council Nutrient Requirements for Poultry (7) recommends level of 2900 kcal metabolizable energy (ME) per gram, 14 per cent crude protein and 2.25 per cent calcium in diets for turkey hens. These are general recommendations and may not necessarily apply to our experimental conditions, the genetic

background, body size, or productive ability of this particular line.

A bird, or any animal for that matter, tends to eat to satisfy its body's caloric needs. For this reason the level of other nutrients such as protein or minerals must be considered in relation to the energy level of the feed.

In most layer feeds calcium is provided in the form of finely ground or pulverized limestone. There is considerable evidence with chickens that, when a portion of the calcium is provided in the form of oyster shell flakes, the quality of the egg shell is improved. These large particles are retained in the bird's gizzard, dissolve slowly and presumably meter the calcium into the bloodstream on a continuous basis. This occurrence is important since a major part of egg shell formation takes place during the night when the hen's digestive tract is normally empty, thus forcing the bird to draw on its bone reserves for the needed calcium.

The following experiment was conducted with 288 Lignébecoise turkey hens housed in individual lay-

ing cages. They were randomly assigned to one of six dietary treatments. Experimental rations were formulated using practical ingredients to supply 14 per cent crude protein and 2.25 per cent calcium. Dietary treatments included three energy levels: 2700, 2900 and 3100 kcal ME/kg of feed; and two calcium sources: all ground limestone or with two-thirds of the limestone replaced by oyster shell flakes. Hens were inseminated weekly with pooled semen. Sound-shelled eggs were set weekly for incubation.

Over the 16 week experimental period egg production was reduced when oyster shell was included in rations at the 2700 and 2900 kcal ME/kg energy levels. Feeding the highest energy level (3100 kcal/kg) resulted in a significantly lower rate of egg production. At this energy level the substitution of oyster shell flakes for part of the limestone restored egg production to normal.

The hatchability of fertile eggs was affected in the same way. That is, it was depressed when the hens were

Guinea Fowl

A New Taste in Poultry?

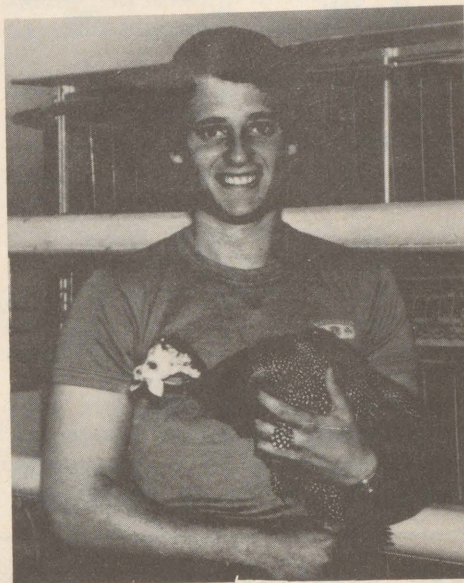
by Pascal De Henau and Sherman Touchburn
Department of Animal Science

In France, with a population of 53 million, the consumption of guinea fowl has reached 60 million birds per year — slightly more than one bird per person and second only to chicken among poultry meats. The French palates appreciate the mildly gamey flavour of this exotic native of West Africa. It gets its name from the country of Guinea but is, in fact, descended from the wild species *Numida meleagris*.

Guinea fowl have been domesticated for many centuries, having been raised as table birds by the ancient Greeks and Romans. Today the Pearl (spotted feathers) and White African are the best known and most widely used in commercial operations.

The early settlers brought guinea fowl to North America where they have existed in small flocks, usually roaming freely on the farm and making a lot of noise but very little contribution to the economy. A limited commercial production provides meat largely for certain ethnic communities and for the restaurant trade. We believe there is a future for commercial guinea fowl production in North America and that we at Macdonald are best situated to assist those who are interested in leading this development.

In Quebec the local strains available are killed at 16 to 18 weeks of age at an average weight of 1200 grams (2.6 lb) and a price about three times that of chicken. We recently imported some guinea fowl eggs from a commercial hatchery in France. They were incubated and the young guineas (keets) are being raised at the Macdonald Campus to evaluate their growth per-



Pascal De Henau holds one of the guinea fowl raised from eggs imported from France.

formance, meat qualities, and reproductive performance compared to local strains. The growth data are shown in Table 1.

First of all it is obvious that the French guinea fowl grow much faster than the average North American birds (1350 or 1602 g [3 to 3.5 lb] at 12 weeks versus about 1200 g [2.6 lb] at 16 to 18 weeks of age as we mentioned earlier). This reflects the intensive selection for inherited economic traits

carried out through the cooperative efforts of the industry and the government researchers in France.

Secondly, the heavier average weight of the imported birds grown at Macdonald may indicate the genetic improvement made since 1979. It may also be a result of feeding turkey and broiler chicken feeds here. The greater amount of feed required (4.55 g) to produce 1 g of gain would surely be improved by formulating feeds to meet the specific nutrient needs of the guinea fowl.

The slower growth and greater feed requirement will keep the price of the guinea fowl broilers well above that of chicken. It is a specialty item and will remain so for some time, but it has much less carcass fat than today's broiler chicken. As a general observation, the guinea also has finer bones and has a more favourable yield of edible meat.

Anyone planning to produce these exotic birds commercially had better be prepared to educate the potential consumer and to develop gradually with considerable marketing effort. It should also be realized that there is still much to be learned about the management of this species — a goal which we at Macdonald hope to work toward.

Table 1. Growth and feed utilization efficiency of imported guinea fowl and earlier data

	Macdonald 1982	France 1979 ¹
Ave. weight gain to 12 weeks age, g	1602	1350
Feed conversion (grams feed/gain)	4.55	3.23

¹L'alimentation des volailles, le pintadeau de chair, 1979. Institut National de la Recherche Agronomique, 37380 Nouzilly, France.

(Continued from page 27)

fed the 3100 kcal diet, but the inclusion of oyster shell particles in this feed yielded a normal level of hatchability. In contrast, the presence of oyster shell particles in the 2900 kcal diet significantly depressed hatchability. In the lowest energy ration (2700 kcal/kg) the inclusion of oyster shell flakes improved hatchability slightly but not significantly.

Based on the results of this experi-

ment, it would appear that:

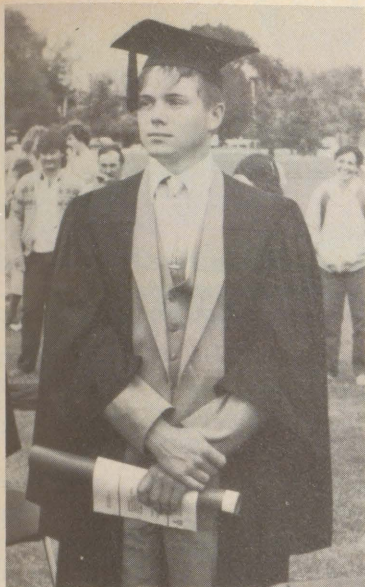
(1) a dietary level of 3100 kcal ME/kg is too high for good reproduction in turkey hens of this type. An exceptionally high level of mortality among these hens adds strength to this conclusion.

(2) inclusion of oyster shell particles to provide part of the dietary calcium improved reproductive performance and livability only in the very high energy (3100 kcal/kg) diet.

(3) the National Research Council recommendations of 2900 kcal ME/kg, 14 per cent crude protein and 2.25 per cent calcium are adequate for these broiler breeder turkey hens housed in cages.

References Cited

National Research Council Nutrient Requirements of Poultry, Seventh revised edition, 1977. National Academy of Sciences, Washington, D.C.



Neil Frederick Burns

Convocation on June 4, 1982, the following students graduated from the Diploma in Agriculture Program:

LANGER, Normand, Mont-Laurier, *Great Distinction*;
 ERSEN, John Phily, Melbourne;
 OOKS, Douglas Norman, Franklin Centre;
 RNS, Neil Frederick, Cookshire, *Great Distinction*, Ralston-Purina Project Prize;
 UTURE, Marc, Ile-Perrot, *Great Distinction*;
 SCENT, Pierre Robert, Verdun, *Great Distinction*, Director's Prize;
 RIGHT, L. Dale, Bromont;
 ANAGAN, Patricia, Ste. Anne de Bellevue, *Great Distinction*;
 SSER, Christian D., Pike River;
 OVER, Kim, West Brome;
 ET, Timothy, Magog;
 NNEY, Marc, Montreal, *Great Distinction*;
 MIRE, Nelson, Lachine;
 DONELL, Kevin Angus, Ste. Anne de Bellevue, *Distinction*;
 GANNETY, Stephen, Dorval;
 MPTPETIT, Bertrand, Pointe Claire, *Great Distinction*, Ministère de l'Agriculture des Pêcheries et de l'Alimentation du Québec daille d'or;
 IRPHY, Mary Clara, St-Bruno, *Distinction*;
 RTLE, Michael, St. Lambert;
 NE, Richard, Ste. Anne de Bellevue, *Great Distinction*;
 EL, James Joseph, Verdun, *Distinction*;
 WITH, David Wallace, Sherbrooke, *Great Distinction*;
 LVAIN, Yvon, Montreal, *Distinction*;
 OMPSON, Mavis Joy, Shawville;
 N ZUIDEN, Alec, Magog, *Great Distinction*;
 TINS, Gunta Sandra, Montreal, *Great Distinction*;
 HITCHER, Gary, Foster, *Great Distinction*;
 RIGHT, Lloyd Edmund, Inverness, *Distinction*.

by Jim Currie

Assistant Director, Farm Practice Diploma in Agriculture Program

The following is the first in what we hope will become a regular series of articles honouring graduates of the Diploma Program who have become successful in their chosen fields. The first student graduated from the Diploma Program in 1909. Since that time approximately 1169 young men and women have successfully completed the program. As late as 1980 we knew of at least two members of the first graduating class who were still living. We certainly hope that this is still true. It is hard to believe that in 1910 there were 31 graduates and that number was not beaten until 1980. On the other hand, the smallest graduating class was in 1943 with only one student. The program has had many ups and downs, wide fluctuations in enrolment and graduates. However, since 1975, with sponsorship from the Quebec Ministry of Agriculture, the situation has stabilized considerably. In fact there has been a definite increase in enrolment each year thus far. With so many graduates spread throughout the world, it is not surprising that there have been many success stories. Some have been spectacular achievements according to popular methods of measuring success. Others are more modest by those standards but quite possibly show greater personal accomplishments. We will try to expose some of them and hope you will respond by writing us, mentioning your own or your classmates' successes.

The place of honour in this issue has been taken by 1975 graduate Charles Fowler. "Chuck" to most people who have ever come in contact with him comes from a small farm background, actually the farm he now owns. He has spent the major part of his life in the area surrounding the little village of Kingsbury, near Richmond, in the Eastern Townships.

One of his first aims in life was to farm, preferably on the family farm. Like most farm children, he has grown up with very strong ties to the home farm and an inbred appreciation for its capabilities. He didn't return to the farm immediately after finishing his Diploma. He spent the first couple of years working for others, always closely associated with farming. Part of that time was spent working at the Macdonald Farm both outside and in the

dairy. It was this time span that probably helped him decide once and for all that he had to farm for himself. It was not necessarily working at Mac so much as a new love in his life, the one he married. Chuck gives a great deal of credit to Lorraine as the real driving force behind their farm.

After working with Chuck's father for a while, the Fowlers purchased the farm in 1979. Obviously working conditions became a lot harder but more self-satisfying. Plans have changed along the way, with new aims and ambitions. The goals now are far different than they were in his written farm project Chuck say, because he was suddenly faced with reality. He no longer wants a larger herd; 30 top quality cows would satisfy him now. He will not grow grains since there is no custom combine in the area, but he would like to be self-sufficient in forages, again, of top quality.

Quality seems to be the catch word, and the herd has received the lion's share of the attention so far. Lorraine deserves a lot of credit, Chuck claims, since she does much of the sire and replacement selection and record keeping. Initially the plan was to reach a 160 BCA herd average. This, however was attained within the first year and a half. They are now at 182/185 BCA with an average production of over 6800 kg/cow, which isn't bad for a bunch of Ayrshires! With any luck the herd will do well in the show ring since the Fowlers are taking this up as a hobby. Given a few years they will probably become well established in this new endeavour as well.

The Fowlers have participated regularly as training farmers for the summer farm practice in the new Diploma Program. They are very keen on this new system and the students they have been able to help along the way. According to Chuck there is no comparison between the old and new programs. He feels that students taking the new program are far better prepared for farm management than he was when he completed his courses.

Whatever the drawbacks and shortcomings, it appears that the Fowlers are on the road to success. We wish them luck since they are a good example of tomorrow's farmers; the kind we all will need.

Prof Profile

"My receiving the award is based mainly on research productivity and this is due in large part to all the excellent students and post docs that have come through my lab over the years. I really can't take credit for more than coordinating the effort of all these people."

Add more than a modicum of modesty to microbes and music and you have a fair measure of Professor Roger Knowles, Chairman of the Department of Microbiology who was honoured by the Canadian Society of Microbiologists on June 8 in Quebec City when he was presented with the prestigious CSM Award for 1982.

A month earlier Professor Knowles received another award — a silver tray for his 25 years at Macdonald. "Some people like to move around but I've found Mac quite congenial and the working environment is good," he said of his 25 years. Roger Knowles came to Macdonald in 1957. Born in Yorkshire, England, he did his B.Sc. at Birmingham and then continued his studies on the microbiology of soils at University College, London. A fellow grad student, who came from Canada, suggested he apply for an NRC Post Doctoral Fellowship. "Why not," Professor Knowles remembers thinking. "It would be a good way to see a bit of the world for a year or two." Instead an offer came from Microbiology at Macdonald and, apart from sabbatical leave, the year or two has become 25 and still counting.

The announcement of Dr. Knowles's award reads: "he is being honoured for his studies on nitrogen transformations in soil and water, particularly nitrogen fixation, nitrification, and denitrification . . . He is the author of a number of comprehensive reviews pertaining to the nitrogen cycle as well as 63 journal papers." When we talked with Professor Knowles, he told us that a review on denitrification had just recently come out and that he was being deluged with reprint requests. Some five to 10 a day. "It's incredible," he said of the response. "Microbiological Reviews" is a journal with quite a wide circulation. Denitrification, a process in which nitrogen is released and lost to the atmosphere has caused a great deal of interest from various points of view. I tried to restrict the literature covered, but I ended up with 448 references."

by Hazel M. Clarke
Editor

Our interview was sprinkled with warm, dry humour, a sampling of which surfaced when Dr. Knowles admitted to an early start each day and some evening and weekend work to enable him to keep ahead of his teaching, research, and, as Chairman, administrative work. He also borrows some time by being on the odd committee that forgets to inform him! I was on the Control Board for one organization almost three years before I realized it." And, closer to home, "I've just been nominated onto the Scholarships Committee. I was supposed to be at a meeting the other day, but they didn't know I had been nominated!" He also admits that he might work later into the night but for his wife Ruth who "keeps him on the straight and narrow." He met Ruth, who was field technician for the Quebec Women's Institutes, at Macdonald. Before their marriage in 1963, Roger Knowles had been made Warden of Brittain Hall, the Men's Residence; a position he held until he and his wife moved into their present home in Baie d'Urfé in 1966 where Professor Knowles remembers "the silence kept us awake at night."

Professor Knowles has since served Macdonald by doing a three-year stint on Senate and he was Chairman of the Academic Standing Committee for about five years.

Off-campus, Roger Knowles is on the editorial board of an American journal *Applied and Environmental Microbiology* and was Scientific Editor for the *Canadian Journal of Soil Science*. He is also active on committees for both the Canadian Society of Microbiologists and the American Society for Microbiology.

Off-campus, too, are two pastimes — one fairly recent though it has a touch of the past and one that has sustained him for most of his life. The new addition is sailing which he and Ruth and (at times) their two teenagers Michael 15 and Cindy 14 have grown to love: "We've only been sailing for the last three years and wish we had



Professor Roger Knowles, left, receiving a gift for his 25 years at Macdonald from colleague Professor R.A. MacLeod.

started much earlier because we enjoy it so much. We've got a 22-foot Tanzer. Last summer we sailed to Ottawa, through the Rideau Canal system to Kingston and then back down the St. Lawrence through the Seaway. It was a four-week trip with two teenagers on board. Remarkably, we survived."

Before entering University in England Roger Knowles had served a two-year stint in the navy. "I did some sailing then on a big sail boat, but was just a member of the crew."

While in the navy, at university, and here at Macdonald he has always found time for his musical talents, the clarinet, the viola, and singing. His musical connections started just two or three weeks after arriving at Macdonald. "I met Gertrude MacFarlane who had a recorder group with Mario Duchesne, and I was also asked if I would like to join the Bach Choir in Montreal. We went to festivals in Vancouver, Banff, and to the International Festival in Osaka, Japan, in 1961." Unfortunately the choir folded and some of the group joined the Tudor Singers. Roger Knowles stayed with them until his sabbatical leave in 1974 when he and his family spent a year at the Centre National de Recherche Scientifique in Nancy, France. When he returned he found that the Tudor Singers had gone professional. "I had been playing chamber music off and on throughout the whole period so I joined the Lakeshore Chamber Orchestra and am still playing the viola with them."

In the line of duty, Professor Knowles has been to international congresses in Mexico, Moscow, and Europe, and to an international symposium in Canberra, Australia, about 1-1/2 years ago. He has also been to Brazil several times. "Back in '74 a worker there reported what looked like a rather significant association between a particular bacterium and the roots of certain very important tropical

(Continued on page 40)

LESSONS FROM STUDYING A TROPICAL ISLAND

by Professor Stuart B. Hill
Department of Entomology

The island already has most of the resources required to meet the people's needs, although most of these are not being used or were being used inefficiently; the effects of the various activities taking place are strongly influenced by time and space; the introduction of "foreign" materials and concepts, and increased dependence on them, generally weakens indigenous systems as does an increased dependence on "foreign" markets; the sustained development of the island (external development) is limited by the development of the people (internal development), especially those responsible for decision making. These were some of the conclusions I arrived at during a 3 month stay on one of the 92 islands in the Seychelles off the east coast of Africa. This working visit, which started last January, was part of various activities I have undertaken over the past 9 months of sabbatical leave.

Although these islands comprise only 444 sq km of land (Montreal island is over 500 sq km), they enclose an area in the western Indian Ocean of 34 000 sq km. The capital, Victoria, on the main island of Mahé lies 1759 km from Mombasa on the coast of Kenya to the west and 3255 km from Bombay on the coast of India to the east. The population is 70 000.

The island I visited is only 1.9 km long and 1.0 km wide, i.e., the size of Manhattan Island off Montreal. It is part of the Amirantes group of islands and lies 76 km southwest of Mahé. It has a population of about 40, mostly males. The soil is coralline sand (pH 8.0 to 9.5) with a few bird guano deposits, and the vegetation is dominated by planted coconuts, mostly over 50 years old. Vegetables and fruits are grown, although many are still imported, as are most beverages, drugs, and other products of industrialized countries. Copra, the dried flesh of coconuts, is the main export item, and a vanilla plantation is being established with hopes of finding an export market. Marine fish, chickens, and milk form the primary source of protein, and imported rice the main source of carbohydrate.

Two years earlier, I visited the island for two weeks with three other "experts". At that time, we established composting procedures, advised on legume establishment, vegetable production and pest control, and built a freshwater lake together with various renewable energy devices. Although most of these developments were potentially beneficial, they were either abandoned soon after we left or were never properly instituted. Others had also visited this and similar islands in the Seychelles and had produced a number of reports full of recommendations, most of which have never been adopted.

It was obvious that if I were to be effective in helping the people of this island, I would have to avoid repeating the mistakes of the past. I started by studying the island. I had carried out a literature search before leaving Canada and had written to tropical agriculturists from around the world to obtain relevant materials, and the island's library had many valuable publications, including the excellent multi-volume encyclopedia "The Wealth of India". I met with all the local experts, who were very helpful and anxious to cooperate. Part of every day was spent talking about the island with its various residents, working with them, and studying the resources of the island, particularly the plants. This was facilitated by the existence of a named collection of plants and because one of my projects involved examining (bi-weekly) about 60 Rhinoceros beetle traps located throughout the island. This was one area in which I had thought that I could make a valuable contribution. The Rhinoceros beetle, which is one of the largest living insects, is the major pest of coconuts on the island. It eats the succulent developing fronds and considerably weakens the tree. Relatively recently, it had been discovered that the beetles can be controlled by infecting them with a virus, which they obligingly distribute to other members of their population. Traps containing an attractant ethyl chrysanthemate are used to catch the adults, which are then infected by placing a drop of li-

quid (containing the freshly masserated gut of an infected beetle together with a little sugar) on the mouthparts of the insect, which is laid on its back during the process. These are then released. Fortunately, they stop feeding after they become infected, and by visiting egg-laying sites (rotting coconut logs) they distribute the virus to the larvae, which die before becoming adults. On arriving in the Seychelles with all this information, I was surprised and happy to find that a visiting insect pathologist was already in the process of establishing a Rhinoceros beetle control program; hence I was able to collaborate with him and make much more progress than if he had not been there. My main contribution concerned the substitution of ultra-violet light traps for ethyl chrysanthemate traps. One UV trap was able to catch as many beetles in a single night as the 60 traps caught in a week and took two minutes to service as opposed to two hours (or four hours if they were examined twice a week) for the ethyl chrysanthemate traps.

Other side projects included the following: the use of diatomaceous earth and boric acid formulations to control household insects, particularly ants and cockroaches; the control of flies by the establishment of proper waste handling procedures; the use of aquatic vegetation as soil amendments and animal feeds; the expanded use of shredded coconut husks as a mulch both in the vegetable garden and coconut plantation; the establishment of composting procedures that maximized conservation of plant nutrients and minimized fly problems; the use of windrows (oblong piles of organic matter) along coconut rows together with the planting of stoloniferous legumes and fodder and food producing trees along these "islands" of fertility. Ladybird beetles of several species were imported and released as biological controls for scale insects, the other major pests of coconuts; seaweed was processed and used as a form of foliar feed for plants (it is a good source of growth

(Continued on page 40)

They Dined with the Queen

by Hazel M. Clarke
Editor

"I had a grin from ear to ear." That was the initial reaction of Dr. David Bird, Director of the Macdonald Raptor Research Centre and a wildlife professor in the Department of Renewable Resources, to the news that he had been chosen to dine with the Queen. His wife Toni, who broke the news to him at the dinner table some two to three weeks prior to the dinner, had a difficult time convincing him that it was really going to happen.

Rick Younge of Shawville, Quebec, who graduated from the Diploma in Agriculture Program in 1981, was, in a word, "delighted." These young men were two of the 282 — one from each federal riding — outstanding young Canadian achievers who were invited to dine with the Queen, Prince Philip, and Prime Minister Pierre Elliott Trudeau in Ottawa on April 16, the night before Her Majesty signed the new Canadian Constitution. Mr. Hal Herbert, M.P. for Vaudreuil riding chose David Bird while Tom Lefebvre of the Pontiac-Gatineau-Labelle riding selected Rick Young (see page 33).

A native of Toronto, Dr. Bird professes to a wide range of interests in the field of raptor biology. "My research encompasses everything from management behaviour, ecology, and physiology to parasitology. Instead of focusing on a wide range of species in a given research area," he explained, "I've focused on a given set of species in wide ranging research fields."

Professor Bird did his B.Sc. in Zoology at the University of Guelph before coming to Macdonald in 1973 where he pursued his M.Sc. ('76) and Ph.D. ('78) in Wildlife Biology. While working towards his Masters, David Bird was appointed Curator of the Macdonald Raptor Research Centre (see insert) and became Director in 1978. The Centre has gone through some financially difficult times since its inception and welcome relief came in 1980 when David Bird was one of the 100 recipients of a Research Fellowship from the Natural Sciences and Engineering Research Council. The grant allowed the Centre to continue its various projects without the annual concern of maintaining a Director's salary.

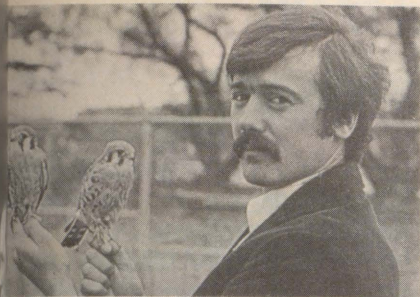


Of concern to David Bird, as he drove up to Ottawa for the dinner, was where to change his clothes. "I think I was the only one at the reception who arrived with my suit over my shoulder asking where I could change." Once in the reception rooms — there were four — Professor Bird admitted to feeling quite lonely. "Although there were some 500 people — young and old — there were no familiar faces," he said. While wondering what he was doing there, "an attractive young girl, who mistook me for someone else, stopped and we started chatting. She had just been running in the Newfoundland provincial election; had been on national television as an entertainer... and she was only 21. I realized that she was an achiever and this feeling carried over through the actual dinner. These people had accomplished something and I felt proud to be with them."

At the dinner itself, there were eight people assigned to each round table. As the young achievers ranged in age from 18 to 35, there were various ages and interests at each table. "I sat with a young actress, a girl with Parkinson's disease who, although she wondered why she was there, obviously had a far greater challenge than most of us. One fellow worked with special opportunity kids, and most of the others were

high school students who were presidents of their student societies," David Bird recalled.

Returning to the reception rooms following dinner, the Queen and her party mingled with the guests. It was here that Professor Bird unintentionally broke protocol not once but twice. "All day long I had been memorizing what I was supposed to say and do and only if spoken to! David Bird knew that his Welsh-born mother would be delighted if he spoke to the Queen and "as I watched some of the others to whom the Queen spoke, they seemed shy, only answering with yes's and no's. I thought if we do speak, I'll try to make it interesting. When I did make eye contact with the Queen, I forgot all I had memorized and just blurted out, 'Welcome to Canada, Your Majesty,' realizing too late that it was not in good taste. She replied, moved on, then came back and asked what I did. I told her that I was a professor at McGill working on endangered species. Knowing of his interest in the World Wildlife Fund, I added that I was very pleased that Prince Philip took such an active interest in helping endangered species including coming to Canada in the fall to help auction paintings. Before the Queen's party moved on, Professor Bird was also able to speak briefly to the Prime Minister.



David Bird

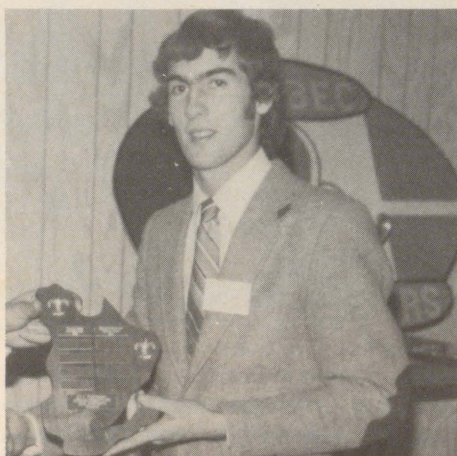
Did David Bird rest on his laurels? Not likely. A week later he was off to Seattle to give two papers and an evening presentation on the Raptor Centre at the 3rd World Conference on Birds of Prey. In June he was off to his alma mater, the University of Guelph, to receive a Medal of Achievement in recognition of his accomplishments over the past 10 years. Again Dr. Bird was pleased and, in discussing this award, his grin was almost "ear to ear."

THE MACDONALD RAPTOR RESEARCH CENTRE

The overall purpose of the Raptor Centre, which is located on the Macdonald Campus just north of the Macdonald-Stewart Building, is to aid in the conservation and management of birds of prey and to foster understanding by the public. Author-conservationist Gerald Durrell attended the official opening in the fall of 1973 and since that time its primary function as a research centre has reached a level of maturity. It was the endangered Peregrine falcon that sparked the initial interest in some at McGill and Macdonald to establish the Centre. The project was aimed at obtaining young, raising them, and eventually restoring falcon populations in wild areas. David Bird explains, "When I was given the job of curator in 1974 we revamped our purpose of being into something that would complement the existing peregrine program. We would establish a colony of easily bred kestrels, as one example, and try to develop techniques such as artificial insemination and artificial incubation that others could use. Starting with 10 pairs of American Kestrels, our pedigreed colony now totals 300 in addition to 50 large hawks, falcons, and eagles. This ranks the Centre as the largest captive birds of prey colony in the world. The prospects look good. We have potential now for supplying birds for airport control of pest birds; we're getting involved in toxicology contracts from the federal government, and we hope to expand our education program." A monograph on the laboratory management of the kestrel and a book on kestrels of the world are currently in the works.

Rick Younge is a Jersey man. He appreciates a good cow of any breed, but his heart is in Jerseys. Last summer he was at a Jersey picnic in eastern Ontario where a special guest was Mr. John Cowdrey, the herd manager of the Queen's Jersey herd at Windsor. Rick exchanged a few words with him and so it would have been quite natural, as he explains "to discuss Jerseys with the Queen. I realized that she probably doesn't have too much time with her busy schedule to know much about her own herd, but I wanted to talk about something that she could relate to so I was going to tell her that I was involved with Jersey cattle and knew she was too." The Queen smiled and nodded at Rick. The night he and 281 other young Canadian achievers dined in Ottawa, but he was not one of the ones who stopped to chat with. Despite this, Rick thought the evening a great success, a great honour for him, and a wonderful opportunity to meet so many people.

A graduate of the Diploma in Agriculture Program in 1981, Rick Younge then 20, of Shawville, Quebec, was chosen by M.P. Tom Lefebvre to represent the mainly agricultural riding of Pontiac-Gatineau-Labelle at the dinner. Rick is farming with his father on a 600-acre farm. They have an



Rick Younge

overall herd of about 150 and milk between 70 and 80 cows. Rick admitted that he got out of chores the night of the dinner. "I got things started and worked till about 3:30 and was back doing chores the next morning, but we did watch the ceremonies on Parliament Hill on television."

Rick Younge has already made excellent contributions to agriculture and rural life. According to Ann Louise Carson, Provincial Coordinator of the Quebec Young Farmers, "he was a member of his local Young Farmers' Club in Shawville and held positions of Vice-President, President, and Provincial Director. He was elected Provincial President for the 1980-81 year

after serving as Vice-President the previous year. During this time, Rick was committed to meeting and assisting as many young members as possible across Quebec."

Being in Young Farmers, particularly his term as President, was a real learning experience. "It was an education in itself," Rick said. He was especially pleased to be able to meet so many people, many of whom he hopes to keep in touch with in the years ahead. When he met David Bird in one of the reception rooms after the dinner, it was news of the people at Macdonald that interested him. "I hadn't been back at Mac for over a year and it was great to catch up on the news." Rick Younge is still interested in the QYF and is President of the Shawville Jersey Club. "Having just settled back in at home, I haven't got too involved in too many things as yet," Rick said. He did, however, find time last August to get married, and he and his wife Cheryl are proud of their new daughter Rebecca Ann, born on May 30th. He was a proud young man, too, on the night of April 16th. "It gave me real pleasure after the meal was over that 282 young people from all across the country stood as one person with our Prime Minister and sang our national anthem. It was a feeling I will never forget."

The Morgan Arboretum and Conservation Education

by Professor J.D. MacArthur
Curator, Morgan Arboretum

The Morgan Arboretum Association continues to collaborate with the Ministère d'Énergie et des Ressources (MER) in offering a program in conservation education for school classes. The MER, through its Service de l'éducation en conservation, provides the budget for this project which is organized and administered by the Morgan Arboretum Association. The project is conducted in the Morgan Arboretum and Woodlands with operations based in the Morgan Arboretum Conservation Centre.

The objective of the supporting agency is to promote the simple basic philosophy of respect for the forest as a resource which, if managed with care or properly conserved, can supply many important values. These range all the way from beauty to raw material — from spring flowers to pulpwood — and from animal habitat to maple syrup.

In this program the word conservation means "wise use." It is assumed that people will make increasing demands on the forest and that forest conservation will become increasingly important with the objective of establishing the best possible balance between ecology and economy.

The major effort on the part of the MER to promote among young children an interest in the forest resource and its value to people is made with the objective of generating in the minds of many decision makers of tomorrow the desire to learn more about the forest. It is hoped, and expected, that they will become, in their time, effective promoters of wise use.

In the Morgan Arboretum program 12 bilingual nature interpreters are engaged during May and June in conducting tours on trails in the Arboretum and Woodlands. School classes arrive by bus at prearranged times and are divided into groups of 10-15 children per interpreter. After a brief introduction the groups depart on separate trails for guided visits of about 2 hours duration.

The interpreters strive to stimulate the curiosity of the children. They encourage them to explore, to discover, to discuss, and to speculate. Here the

interpreters act as animators by their questions and suggestions. There is no fixed plan or recipe. Every tour varies with the group, the interpreter, the trail, even the weather.

Many children see the forest world for the first time on these visits. Therefore, every possible effort is made to capture their interest, to awaken their desire to know more about the forest as a fascinating place to enjoy, to study, and to understand.

Effects of the program are difficult to measure if not impossible to determine. Over the years many thousands of children have enjoyed it, but the extent to which their future attitudes have been affected will probably never be known. However, all who are involved in the program are convinced that there will be a significant return on the investment even if only a small percentage of the visitors become the wise users of the future.



The Arboretum Volunteers

by Helen Jones
Chairman, Morgan
Arboretum Volunteers

The relatively new volunteer program at the Arboretum is a success story both for the Arboretum and for the volunteers; continued success now depends on the recruitment of many more conservation-minded citizens.

The seed for the program may have been planted in February, 1981, when Principal Johnston said, "I wonder how you can apply Edison's advice — 'when you have no money, think?'" A column in the McGill Daily entitled "Coping with Austerity" told how some University departments were trying different ways to permit budgets to stretch further, fill the gaps, and still carry on efficiently. Soon afterwards, Professor Arch Jones sadly remarked, "It's too bad that we cannot open the demonstration sugar house for children's tours. They used to be popular."

With these comments in mind, a group of women closely connected with Macdonald joined forces. Their first project was the children's sugar tours. They were given a short course in sugar-making so that they could explain the procedure to the children. The Arboretum Foreman John Watson

repaired the sugar house, and a few phone calls were made to play groups and elementary schools nearby informing them that the tours could begin, and they did. Their success can be judged best by the comments of the teachers and the children:

"It was a fantastic tour. I hope we can come back in the spring to see the wild flowers." "We liked the way the children participated by actually collecting the sap and stoking the fire. It made them feel like real syrup makers." "The maple syrup was yummy, and then a chickadee ate from my hand."

The volunteer committee, which has grown to include many men, has met regularly since it was formed last September.

They focused attention on the Conservation Centre as a start. This building, adjacent to the parking lot at the gates to the Arboretum, was built late in 1979 to provide facilities for the spring and summer nature education program and as a more convenient centre for membership activities such as field trips and seminars. It also serves as a display centre for

Meet the Teacher!

Hazel M. Clarke

litor

are not telling tales out of school saying that it is the human interest le that appeals to people in most ies or articles. Although we might it of interest that this fall will mark 34th consecutive year that Mac- ald has offered Extension Courses he community, others might prefer know something about the people olved in the courses. We trust that at follows will be a suitable com- mise. Some 46 courses are being

offered this fall, winter, and spring in Agriculture and Rural Living; they are being taught by over 34 people who are either members of the Faculty, Macdonald staff or senior students specializing in particular areas, or off-campus instructors whose fields of expertise complement the program.

At random, we chose a retired academic, Jim Cooper, whose course "Farm Welding" is one of the most popular on campus, an academic, Pro-

fessor Vern Vickery, Curator of the Lyman Museum and Professor in the Department of Entomology, who teaches the equally popular course "Beekeeping," an evening course teacher in his second year with the program, Albert Legrand of the Emile A. Lods Research Centre who, we believe, is instructing the longest-running evening course — field crop production — as well as two other courses, and a senior student and former teacher, Arlene Taveroff, who will be offering three brand new courses on nutrition and food.

We knew that Albert Legrand was a Mac grad; we didn't realize until discussing Extension Courses with them that the other two gentlemen also went to Macdonald and Mrs. Taveroff "has happy memories of green grass and lovely old buildings" because she took summer courses out here before Education moved to the downtown campus.

Courses may be all lectures, all labs, mostly field trips, or a combination of any or all forms. Jim Cooper's course in Farm Welding is a "how-to-do" that appeals to men of all ages and occupations. Jim Cooper, who has lived on the 35.7 arpents family farm near Ste Annes since the early '20s, got his B.Sc. (Agr.) in '38. He taught power, machinery, and drafting, as well as mathematics to the Dips and he has observed the Department of Agricultural Engineering grow. As he pointed out, "our first class had two students, one of whom has become a top man in Hydro Quebec." He remembers, in particular, the students who came after the War. "They were much better and, of course, more mature than the normal run of students. I guess it was because they know what they wanted to do." It follows that he enjoys teaching adults as does his welding colleague Ray Shaw, who teaches children at a Mont-real school and finds more time there devoted to discipline than to teaching. Most men who take the course are perfecting a hobby that they can pursue at home; a few are keen on working on equipment for their farms, some are students. Mr. Cooper recalls that



osite page: Christopher McElroy and feathered friend. Above: Artist Helmut Gerth and his stu- s at work beside the Conservation Centre.

etum educational information. As a library is building up under the chful eye of volunteer librarians, utiful posters done by a local artist icting various aspects of the Ar- etum are there for young and old admire; in short, the Centre is oming a meeting place for mbers and friends and the centre money-raising projects. Muffins and were sold to cross-country skiers y Saturday; attractive hasty-notes uring the Chalet Pruche were e available, pancake and maple p parties were held, children's ar parties were a great success attracted many groups.

olunteer ski patrollers, sporting red ges with the Arboretum logo, col- ed money from non-members. red businessmen and women who to be outdoors instituted a week-

day patrol in the parking lot, nabbing non-members and insisting that badges must be worn to identify who have paid for membership. As a consequence, there were 913 new members by March 15, bringing the total to 2555, an all-time high.

Plans are underway for the fall season. Weekly Wednesday workshops will start September 8th. Several artistic and creative members of the committee will give instructions in the fashioning of handicrafts from nature.

An organization is only as strong and as active as the people who work in it. The Morgan Arboretum Association offers tremendous scope for volunteers — to help expand its educational program, to improve its facilities, to use and care for the forest and its trails, and to be outdoors.

women made excellent welders and riveters during the War, but only one woman has attended his evening class to date.

For some 10 years Jim Cooper has enjoyed a most active retirement. Most days find him at the Farm Machinery Shop up at the College Farm — where the welding course is taught. He will either be perfecting a design for special drainage equipment or building them. "I must have made at least 50 tools last year," he said. "They go all over the world." On his farm he also finds time to grow some 30 000 trees that he sells to the retail trade.

Also enjoying teaching adults is Albert Legrand who said, "I was constantly concerned about discipline when teaching children. The students I had last year in Field Crop Production kept me on my toes, but I still found it more relaxing." Born in Montreal, Albert Legrand got a B.A. before coming to Macdonald to study agriculture. I always wanted a farm. "I spent a good part of my youth on an uncle's farm. It was a dream that finally came true." He got his B.Sc. (Agr.) in '48 and bought a farm in Compton in the Eastern Townships in 1951. He and his wife lived there for 28 years. He had a cow-calf operation, Herefords, and also finished hogs until he took up teaching full time. Albert Legrand sold the farm and was delighted to come back to Macdonald in 1980 to the Department of Plant Science's Research Centre. He also visits test plots at Ormstown, Thurso, Joliette, and St. Polycarpe. Excellent background for his course. "Last year the students were interested in growing cereals, in corn and, of course, we talked about hay, silage, weed and pest control. Most of the students were hobby farmers." Albert Legrand will also be teaching a short course on ploughing and a 6-week course on beef production which just might make him nostalgic for his years on the farm!

"Let's Meat", "Fabulous Fish", "Versatile Veggies" may be new offerings on the Extension Course menu, but teaching is not new to the instructor Arlene Taveroff who is a McGill B.Ed. graduate of 1969. "My first teaching job was out in St. Jean. I was the Science Department, and it was a fabulous year for me as I was on my own completely."

Mrs. Taveroff taught for 4-1/2 years,

then spent another 4 years raising a family, moving to Toronto, and moving back to Montreal where she found herself looking for a new challenge. Cooking had always been a hobby so she concluded "it would be interesting to combine my background as a science teacher with my interest in cooking." This brought Arlene Taveroff to the School of Food Science where she is now in her last year, majoring in dietetics.

"Understanding the science behind cooking allows one to be more of an artist in the end, because by understanding the principles of cooking you can deviate from a recipe with confidence and allow your creativity to emerge," she explained and said that she would like to "change people's eating behaviour so that they are eating something they like and something that is nutritious at the same time. Teaching cooking is one way to accomplish this goal and bring the two — the knowledge of nutrition and the love of food — together. If I can I'd like to do it through the media such as television." She has already been teaching at various cooking schools but this is the first time at Macdonald.

Discussing her class, Arlene Taveroff said, "most of my teaching is based on my own basic recipes. Unless there is a specific skill that I feel students should practice, I'll be doing 95 per cent of the cooking and demonstrating. I find that students prefer it. They want to relax and watch. We'll bake, broil, stir fry in a wok (such a nice way of cooking), and poach. I try to keep ingredients simple, easily found, and within a reasonable price range."

One of the courses is on fish. Arlene Taveroff explains that, "it is something that people know they should eat a lot of. They know it is good for them but they don't get around to cooking it very often. I want people not only to know that fish is good for them but also that they can enjoy eating it."

As a good Maritimer from Yarmouth, Nova Scotia, Dr. Vern Vickery should approve of Arlene Taveroff's particular interest in fish. He came to Macdonald, as have many others, via the Nova Scotia Agricultural College, got his B.Sc. (Agr.) in '49 and then returned

to NSAC to teach for 12 years. Back at Macdonald he pursued his M.Sc. and Ph.D., and continued his career here. His expertise is in taxonomy, insect identification — mainly grasshoppers and all their relatives — and — particular interest to us — bees. He will teach one course to the Dips and one to the Degree students, as well as to the Extension Course people, and find no difference in any of the students. He gets the same questions from all ages, levels and try to put across the same points."

There is no one particular type of person interested in bees. Over the years, Professor Vickery says that he has high level administrators, housewives, people on the point of retiring, MUC policemen, and a number of beekeepers. "One man has been keeping bees for 10 years and came all the way from Knowlton. Many are naturally timid when they start, but they get over that fairly quickly. People gain confidence when they have actually handled the bees." As there are 26 hives at Macdonald, students are able to put some of the theory into practice.

There are other courses that go beyond the lecture room and, as Extension Course Co-ordinator Marina Costanza explained, "many of them can be counted on to appeal to students year after year: Edible Wild Plants, Private Forestry and Conservation, and Horse Management are good examples."

Looking over the whole package of course offerings for the new year, she said, "in addition to the old standby Small Engine Maintenance has been talked about for 2 years, and this fall we will finally be able to offer it. A couple of grad students are offering a course, Furry and Slimy — Small mammals, reptiles, and fish. It's different, sound like fun, and should appeal to nature lovers of all ages."

Educational, fun, a break in the routine. Macdonald's Extension Courses have something for everyone and some of our students have been coming back year after year, possibly starting with one general course, then breaking off into more specific areas. These students, too, have many a story to tell, but we'd better leave them for another time.

For further information contact: Community Liaison Office, Macdonald Campus, (514) 457-2000 locals 384, 267.

Four Entomologists in Central America

Our post-graduate students from the Department of Entomology, Albert T. Innamore (Ph.D.), Gérald Lafleur (Ph.D.), Tadeusz J. Poprawski (Ph.D.), and Charles Vincent (Ph.D.), left the 30°C weather of Montreal for the 30°C of Belize on January, 1982, for 30 days. The objectives were to collect insects and other arthropods such as scorpions, spiders, mites, centipedes, and millipedes while taking a rest in an exotic environment. Although this was a personal initiative funded by ourselves, most collected specimens will be donated to the Lyman Museum and the National Collection in Ottawa when processed. The scientific and special highlights of this unique enterprise, presented in the Evening seminar series in Entomology last April at the Macdonald Campus, are reported here.

COLLECTING

The biological aspects of the expedition consisted primarily in the collection of insects preferably, we hoped, in an area where the original forests were somewhat intact. A site for collection was selected before the trip based on the assumption that the more undisturbed areas would remain available for agriculture and logging because of the rugged terrain. The locality chosen was the Mayan village Blue Creek, 12 km east of the Guatemala border in southern Belize, chosen because it met the above conditions and also because of the possibility of using a research station in the area.

Our first experience travelling by bus across the lowlands of Belize showed our assumptions to be correct; the lowlands had long ago been stripped of the natural hardwood forest and subsequently planted with introduced trees for a struggling forest industry. These lowlands comprise three quarters of the land area of Belize and are slowly turning to desert due to several centuries of mismanagement of the resources. The change to a dryland is abrupt in all respects — the large expanse of pine barrens gives way within a few kilometres to lush rain forest covering rugged limestone mountains with occasional Mayan set-



A termite nest in the jungle.

tlements in between. Blue Creek was one of these villages; the mountains rising steeply only a few metres from the palm thatched huts at the edge of the settlement. The research station was unavailable to us, but one of the village residents allowed us to stay in his storage hut for the next 10 days. The slash and burn agriculture techniques employed by the residents over a period of 30 years have produced many small biologically rich hedgerows and overgrown fields. The forests, although impressive in species diversity, were not mature; no canopy had formed, and there was considerable undergrowth on the forest floor. This may have been due to active mahogany operations in the area.

Collection techniques included sweeping with both macro and micromesh nets, pan traps, bait traps, and a Malaise trap. Light traps were not used because the electricity grid had not been extended to this region. Sweeping is a standard collecting procedure providing a high degree of habitat selection, easy mobility, and a good cross section of fauna. The plankton nets pick up small beetles and wasps about .5 mm which would otherwise not appear in a sample. Pan traps collect soil surface insects such as crickets, grasshoppers, beetles, and small wasps. Bait traps were employed in two ways: first, by placing rotting fish in pitfall traps to attract beetles and by filling a can with stale beer and hoisting it into a tree for beetles and ants. The Malaise trap was probably the most productive way to collect insects. Traps were placed across insect fly-ways and intercepted flying insects which were funnelled into a collecting apparatus. This trap was

particularly useful for flies, wasps, and true bugs. Other methods employed involved searching the numerous and sometimes large caves in the region for cave dwelling crickets and spiders; several cave crickets and one cave spider (amblypygid) with a leg span of over 30 cm were captured. Turning over logs and stones also yielded a number of beetles, scorpions, and centipedes.

All specimens were preserved in alcohol, transported by hand through customs, and are now being mounted, labelled, and identified. In all about 100 000 specimens were collected — consisting of approximately 60 per cent flies, 15 per cent wasps, 15 per cent beetles, and 10 per cent assorted other groups. The large amount of flies reflects collecting techniques rather than species diversity; more species of wasps and beetles were collected than all other groups combined. This collection is the first good entomological sample from Belize.

BELIZE TODAY

Belize, with an area of about 26 000 km² and a population of about 150 000 inhabitants, is the second smallest country after El Salvador and the least populated one in Central America.

Belize has three topographical zones: the northern half, a low and undulating plateau with many swamps and caverns; the southern half, dominated by the Maya Mountains averaging 600 to 900 m in elevation, and the swampy coastal lowland with a barrier reef at 16 to 64 km from the shore, including many lovely small islands all along the coast.

Belize City was the capital of the country until the hurricane Hattie destroyed it in 1961; however, it is still the economic centre of the country. The new capital, Belmopan, was built 50 miles inland and serves only as an administrative centre.

It is difficult to categorize the people of Belize because blood lines are confusingly mixed. The most important groups are the Blacks, which include Creoles and Caribs, most of them living in coastal cities. Other important groups are of English, Spanish, Chinese, and Indian origin. Two groups of natives, the Mopan and the Kekchi Maya, account for 17 per cent of the population, half of them living in remote villages near the Guatemalan border.

We spent some time with Mopans at Blue Creek, a small village in the Maya Mountains of southern Belize. For 10 days, we shared their private lifestyle, sleeping on the floor in a straw house, eating their food, and participating in local activities such as fishing and dancing. Every day we learned a little bit more about their history, legends, and hopes.

As in many other underdeveloped countries, the transformation of Mayan traditional society into a new westernized one has created many problems. Alcoholism, youth's migration into the cities, and family breakdowns are some of the main concerns. The new generation has forgotten most of its history and traditions and is on its way to complete assimilation.

AGRICULTURAL PROFILE

As a consequence of the foolish depletion of its forest resources (mainly precious wood such as mahogany, cedar, zapote, and sapodilla), Belize is now dependent on agriculture as the mainstay of its economy — about 75 per cent of the total foreign exchange earnings — but this is not an easy task. About 18 000 km² of agricultural soils have been derived from lime-rich forest material, shales, granites, and sandstones. The lack of base-rich minerals in the mountains is responsible for the poor reserve of plant nutrients in the lowlands, and most soils need frequent and expensive applications of fertilizers. To top this, the Department of Agriculture is in a constant struggle to persuade small farmers to abandon

their age old system of shifting cultivation and slash and burn techniques in favour of modern mechanized methods.

The main crops grown for export are sugarcane and citrus; rice, corn, and red kidney beans are essentially grown for local consumption. Sugarcane, mainly produced in northern Belize, is generally monocultured but sometimes alternated with corn and beans, or even with rice when drainage allows it. Citrus fruits, mainly grapefruit and honey-tasting oranges, are thriving in the alluvial soils of the Belize and Sibun Rivers. About 85 per cent of the citrus production is processed into concentrates for export to Florida and Mexico. Bananas in a myriad of colours and sizes are growing wild all over the southern rugged forests of Belize; commercial plantations in the Stann Creek area are focusing on dwarf varieties and plantains, popular local items when fried or boiled.

Both cocoa and coconut plantations suffered extensive damage from hurricane Hattie. The production of cocoa beans, coconuts, copra and coconut oil and fat barely meets domestic demand. Cohune nuts are grown and used locally for a variety of purposes: cooking oil, charcoal, carbon, wood flour (a moulding material and a base for face powder). Beans and corn are still the primary diet of Indians. Rice is probably the most important food crop and, although a large part is still peasant production, the trend is towards mechanical cultivation, sometimes on a cooperative basis. Root crops are very popular ingredients in the local diet: yams, sweet potatoes, cassavas, and "Irish" potatoes are produced in many backyards or bush farms as are vegetables such as cucumbers, onions, cabbages and tropical fruits of various kinds: papayas, mangos, bananas, rose apples, and so on.

There are about 50,000 head of cattle with emphasis in beef production sufficient to meet local demand and to allow for some export. The dairy industry is in its infancy, and most of the fresh milk and milk products have to be imported; Pigs are reared on a backyard basis throughout the country and, with chickens, are welcomed in supplementing a somewhat boring Belizean diet.

Many locals, especially Mopan and Kekchi Indians, will supplement this

diet with wild game, (iguanas, wild pigs, dwarf deer, parrots, freshwater fish) and with edible wild plants.

MAYAS OF THE PAST

One objective of our trip to Central America was to visit the Mayan ruins — sites of an ancient civilization. Some 7 km northeast of Blue Creek village, our base in Belize, lies a remote Mayan site named Lubaantun, which is rarely visited because of the lack of public transportation. Very little renovation has taken place which allows the visitor to see an almost intact Mayan site now being reclaimed by the jungle.

Contrasting with Lubaantun is the majestic city of Tikal in the province of Petén in Guatemala. It lies in the Tikal National Park, a 576 km² wildlife reserve managed by the Guatemalan government. A visit recommended by tourist guides last 3 days. Tikal was the centre of the Mayan civilization both geographically and in importance. Central Tikal (16 km²) has been renovated from time to time since its discovery at the turn of the century and, in 1956, Pennsylvania State College and the Guatemalan government undertook a comprehensive renovation of Tikal at a cost of several million dollars. There is still a great deal to discover in Tikal; 100 000 artifacts have been recovered so far and at least a million more are expected to be found. The Guatemalan government is actually building better facilities and carrying on archeological research.

The heart of Tikal is a huge complex composed of the great plaza surrounded by temple I and temple II, pyramids where religious ceremonies and human sacrifices took place, and the central and north acropolis where priests and merchants carried out their activities.

No one knows why the Mayas chose a hostile environment such as the tropical rain forests in which to build a civilization.

Tikal civilization declined in 900 A.D. following a 1000 years of splendour. Nobody knows how or why. When Hernando Cortez passed near Tikal in the 1520s, it was already covered by a dense jungle, but the inhabitants of Lake Petén know that a great civilization had once lived some 80 km from there.

newsmakers

on campus

The V.S. Pustovoit Award is the highest recognition that the International Sunflower Association can bestow. It is normally made every two years to coincide with the International Sunflower Conference. The number of awards at any Conference is limited, usually not to exceed two. It may be conferred for outstanding contributions in theoretical or applied research, in any field dealing with sunflowers, which have stimulated the development of the crop and enriched the literature; for development of superior varieties; for major improvement of cultural practices; for outstanding contributions to international cooperation in sunflower science and technology, making possible the interchange of ideas and materials.

Previous awards have gone to plant breeders who made outstanding improvements to oilseed sunflowers in Canada, France, Romania, U.S.A., and U.S.S.R. At the Tenth Conference in Australia in March, 1982, it was conferred on an agronomist from Yugoslavia, and on plant pathologist E. Sackston, Department of Plant Science, Macdonald Campus.

Three months later, Professor Sackston was again honoured, this time by the Canadian Phytopathological Society at its Annual Meeting in Edmonton in June 1982, which made him a fellow of the Society.

Elizabeth Jennaway-Eaman, of the School of Food Science, is currently President of the Quebec Home Economics Association and presented them at the Annual National Conference of the Canadian Home Economics Association which was held in early July in Edmonton, Alberta. One of the aims of the Quebec Home Economics Association is to promote the well being of individuals and families; among its goals are the encouragement of research and the sharing of communication and cooperation from the local through to the international level of home economics groups. Mrs. Jennaway-Eaman is also serving as President of the Apparel Studies Association of Canada and attended their executive

meeting in Toronto last May. The Association promotes research studies — aesthetic, behavioural, cultural, economic, or structural — related to apparel. It also encourages communications between researchers and people employed in manufacturing, retailing, government, consumer services, or higher education.

Dean Lloyd and Dr. Florence Farmer, of the School of Food Science, were among the many members who responded recently to an invitation to attend the annual convention of the Canadian Society for Nutritional Research in Edmonton. Included in the program was an anniversary symposium entitled: "The next 25 years: New Challenges for Nutritionists."

Drs. Lloyd and Farmer were founding members of the Nutrition Society of Canada (which became incorporated last year under the new name) and both were present (along with Dr. Crampton) at the first annual meeting held in Kingston in 1958. At that meeting an official list of 90 Founding members was drawn up — 44 are still members (22 emeritus and the rest still active). Lew Lloyd was president in 1970-71 and Florence Farmer has just completed a 5-year term as secretary. Dr. Crampton's influence on nutrition research in Canada is still being felt through the many students whose lives he touched when they were at Macdonald: Jack Aitken, Milton Bell, Gerry Brisson, Keith Murray, and Ian Sibbald were some of the Founding members who will be remembered.

off campus

C. WILSON SPENCER, B.Sc. (Agr.) '39, has been appointed vice-president, business development, for General Foods, Inc.

Dr. JAMES M. FULTON, B.Sc. (Agr.) '47, has retired from his position as director of the Harrow Research Station in Ontario.

A. PETER MacVANNEL, B.Sc. (Agr.) '50, has been appointed marketing manager for Schenectady Chemicals Canada Ltd.

G. FERNANDO DI LABIO, B.Sc. (Agr.) '54, received a Masters of Business Administration, magna cum laude, from the School of Business Administration, Peppersine University, Malibu, Ca. in April 1982.

Dr. JOHN R. OGLIVIE, B.Sc. (Agr.) '54, director of the School of Engineering, University of Guelph, Ont., has been elected a Fellow of the Canadian Society of Agricultural Engineering.

MILTON R. HOOKER, Dip.-Agr. '56, has been appointed general manager, Quebec region, for Masterfeed of Maple Leaf Mills, Ltd., and will also take responsibility for the growth of their recently-acquired Enerpro By-Products.

G. ROGER OTLEY, B.Sc. (Agr.) '59, has been named executive vice-president, functional operations, for the Royal Trust Corp., of Canada.

DAVID H. LEES, B.Sc. (Agr.) '65, M.Sc. '67, has been appointed group vice-president, responsible for the sales, marketing, and technical divisions of the Griffith Laboratories, Ltd.

JOHN ANGUS MacLELLAN, B.Sc. (Agr.) '67, received a Masters in Continuing Education from the University of Saskatchewan in Saskatoon last October.

JIM T. GENDRON, B.Sc. (Agr.) '74, has joined the resource evaluation and planning division of Alberta Energy and Natural Resources as regional resource coordinator in St. Paul, Alta.

GAYLE (TEMPLE-HILL) MACKAY, B.Sc. (F.Sc.) '75, teaches nutrition part-time in Truro, N.S.

A. WAYNE MACKAY, B.Sc. (Agr.) '78, of Truro, does forestry research for the federal government in Nova Scotia.

MORRIE PAUL, B.Sc. (Agr.) '80, began a one-year posting to Botswana, Africa, as an agronomist-land resources officer for the Food and Agriculture Organization of the United Nations in May.

deceased

MELVILLE E. DUORTE, BSA'13, MSC'14, Ph.D.'21, at Montreal, Que. on July 31, 1981.

Dr. J.D. NEWTON, BSA'17, on October 6, 1981.

J. FRED HOCKEY, BSA'21, at Kentville, N.S., on December 6, 1980.

JAMES A. GOLDIE, BSA'25, at Barrie, Ont., on October 30, 1981.

JEAN DODDS, nee Leach, BHS'30 in Farnham, Surrey, England, on May 28, 1982.

ARTHUR J. HICKS, BSA'27, M.Sc. (Agr.)'31, at Caracas, Venezuela on April 5, 1981.

ROBERT A. SMITH, BSA'30, on January 25, 1982.

D. ARCHIBALD FINLAYSON, B.Sc. (Agr.)'32, M.Sc.'34, on January 30, 1981.

JAMES ALEXANDER DUNN, B.Sc. (Agr.)'38, at Victoria, B.C., on September 4, 1981.

NORRIS NUSSEY, B.Sc. (Agr.)'41, at Ormstown, Que., on October 22, 1981.

Dr. ALLAN CHAN, B.Sc. (Agr.)'44, M.Sc. (Agr.)'46, at Ottawa, Ont., on January 11, 1981.

ALAN D. TENNANT, B.Sc. (Agr.)'46, M.Sc.'48, Ph.D.'55, on July 5, 1980.

CATHARINE G. BALL, B.Sc. (Agr.)'47, at Barbados, on March 30, 1982.

GEORGE W. SUTHERLAND, Dip-Agr.'56, at St. Armand, Que., on March 23, 1982.

STUART R. McDONALD, DIP—Agr.'66, B.Sc. (Agr.)'71, on November 22, 1981.

(Continued from page 30)

forage grasses and corn as well. This stimulated a great deal of work in Brazil with some very significant funding from the Brazilian Research Council. I was asked if I would be on an international advisory committee that was being set up. I went down twice for meetings and on one occasion I took part in an international sym-

posium in Brasilia and on another occasion I took part in a three-week course on nitrogen fixation." Professor Knowles was teaching 20 to 30 very keen students and found it an interesting experience.

He is still meeting former students, though not necessarily from Brazil. As he explained, "At every meeting of both the Canadian Society of Microbiologists and the American

Society, we have ex-Mac parties. A real Mac reunion of about 15 to 20 people — and this is just from Microbiology. Former undergraduates or post-graduates turn up at meetings on a fairly regular basis and look forward to seeing everyone again. It's an excellent way of keeping in touch."

We're certain that they also looked forward to seeing Roger Knowles receive the CSM Award for 1982.

(Continued from page 31)

hormones and trace elements); copra waste was used as a livestock feed supplement; diatomaceous earth dust baths were established for controlling insect and mite parasites of chickens, and collections were made of the insects and soil fauna of the island.

Most of the plants are iron and manganese deficient. Efforts to supply those nutrients are, however, often ineffective because they become unavailable due to interaction with the calcareous soil. This problem was overcome by making a hole near the plant to be fertilized, placing a little coconut fibre in the bottom to absorb nutrients leaching out, putting some half-finished compost on top of this, placing the iron and manganese salts in the middle of the compost (insulated from the surrounding soil), and covering the hole with shredded coconut husk as a protective mulch. The hormones released during the breakdown of the compost promoted root growth in the target plant; roots penetrated the compost, thereby gaining access to the iron and manganese and to the various other trace elements in the decomposing material. By choosing a standard location for such holes, with respect to each coconut tree, they can

be serviced every few years without having to dig new holes. Similar procedures were followed for establishing legumes, although in this case suitable bacterial inoculants were also added.

Toward the end of my stay, I prepared two reports. The first comprised a series of summarized descriptions of the management procedures used on the island. These were followed by "comments" in which I summarized all the information contained in the many reports I had read, together with my own observations and insights. I also provided basic information concerning such topics as soil properties, hydrology, composting, and pest control. By the end of my stay, many of my recommendations had been instituted, such that at a final meeting held to discuss this report, a frequent comment was "yes — that is what we do!"

Even more exciting for me was the other report, which was completed after leaving the island. This comprised an annotated list of the 120 plant species of the island (excluding recently introduced crop and ornamental species) a lexicon of Creole, English, and Latin names and indexes of medicinal and non-medicinal uses. This information was typed onto cards (about 300 in all), which were then plasticized to protect them from wear

and assembled in a protective metal case. There were many surprises during the compilation of this information. For example, it was found that 16 non-commercial species produced edible fruits and/or pods, about 50 had edible shoots and/or leaves, and 30 non-grasses (including many trees) could be used as livestock fodder. About 100 non-medicinal and 100 medicinal uses were indexed. Some plants, such as the legume *Sesbania grandiflora*, although they are not now being used, have multiple uses; about 30 were listed for this species.

I believe that such guides to the resources of an area will promote sustainable development by helping people to become aware of their existing resources and to feel more self-reliant and less dependent on foreign inputs.

I learned a great deal about the workings of the external and internal world by studying that island and its people; most of all, I discovered that both the island and the people already have most of the resources required to establish a sustainable, nourishing, and fulfilling lifestyle. What was missing was a recognition of these resources and strengths. It is my hope that I helped to expand that awareness and so facilitate the process of development of both person and planet.

REUNION '82

All welcome, especially graduates of years ending in 2 or 7.

Macdonald Reunion will be held on October 2 on the Macdonald Campus at Ste. Anne de Bellevue



GENERAL EVENTS

MACDONALD REUNION WEEKEND

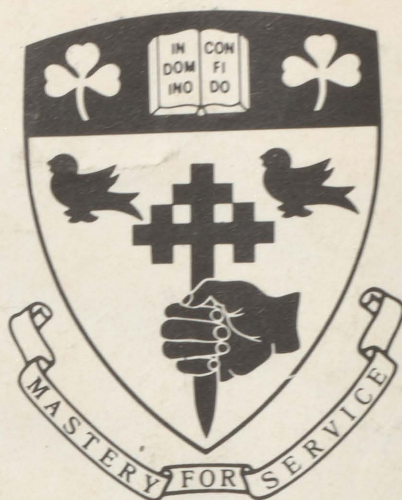
Friday, October 1st

Opportunity for Class Parties or warm-up.

Saturday, October 2nd

- | | |
|-------------------------|--|
| 9:30 a.m. — 5:00 p.m. | — Hospitality, Registration and Display in the Centennial Centre Lounge. |
| 11:00 a.m. | — Campus Tours by Ballade (also 2:30 p.m. and 4:00 p.m.) |
| 11:30 a.m. | — Reception in Ballroom Foyer. |
| 12:00 noon | — Graduates' Luncheon , including the Macdonald Branch Reception and Annual Meeting (classes at separate tables). Special recognition of the 50th Anniversary Class. Guest Speaker — Dr. Gus MacKenzie. |
| 2:30 p.m. | — Tours of the Macdonald-Stewart Building (also 3:30 p.m. and 4:00 p.m.) |
| 3:00 p.m. — 4:00 p.m. | — Special Campus Visits to the Pilot Plant, Brace Research Office, the Barns, and/or the Raptor Centre. |
| 6:30 p.m. | — Macdonald Branch Reception in the Lounge. |
| 7:00 p.m. | — Graduates' Reunion Dinner — The Vice-Principal, Dr. Lewis Lloyd, and Mrs. Lloyd will welcome all returning graduates, spouses, and friends to this event to honour the 25th Anniversary Class of 1957. Make up a class table of your own. |
| 9:00 p.m. — 1:00 a.m. | — Dance in the Ballroom (music to suit everyone by a popular dance band). |
| 10:00 p.m. — 11:30 p.m. | — Coffee in the Centennial Centre Lounge. |

A GENERAL BROCHURE AND ORDER FORM WILL BE MAILED TO ALL GRADUATES IN LATE AUGUST



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